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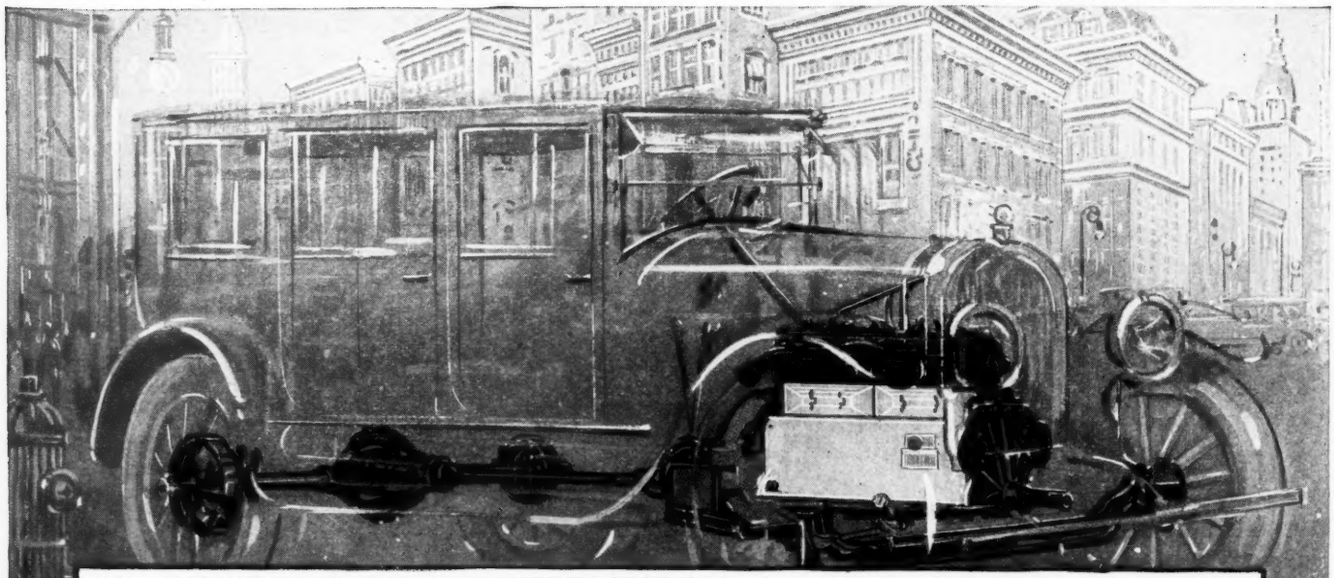

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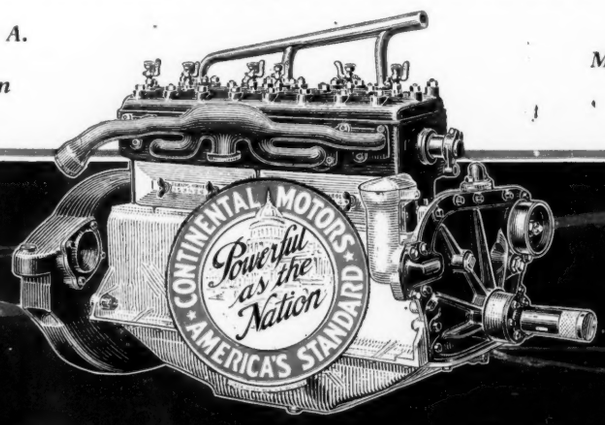

Continental Motors

AUTOMOTIVE INDUSTRIES
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VOL. XLVI. NEW YORK—THURSDAY, MAY 25, 1922 No. 21

Domestic Sales Depend Upon Export Stability

Buying power of Americans, especially farmers, determined chiefly by activity of export market. Business men at Chamber of Commerce of the United States meeting say industrial activity will continue. Complete recovery depends largely upon Europe.

By Norman G. Shidle

THE continued upward swing of business in the United States depends very largely upon the ability of American manufacturers to sell their surplus products abroad. Domestic business rests directly upon the stability of foreign countries and upon their ability to absorb a certain percentage of American products. The buying power of the American farmer, particularly, is strongly dependent upon the recovery of his foreign markets since a comparatively large percentage of the market for agricultural products in the past has been abroad.

Foreign trade can, therefore, be considered as an index of probable prosperity at home, since its advance or decline affects to a marked degree the buying power of the people of the United States. Some improvement has taken place in many of the countries of Europe, but stability has not yet been reached. Consequently, it is apparent that full industrial prosperity is not to be expected in the United States immediately.

The United States should not erect tariff barriers likely to hinder the free exchange of commodities with foreign nations. Europe can buy from us only through the exchange of goods and that exchange can take place only if our tariff laws are such as to encourage easy commercial intercourse with foreign merchants.

There is every indication, viewing both the foreign and domestic situation, that American business has started well on the road to recovery and that the present increase in industrial activity has a sound and permanent basis in general economic conditions.

These were the keynotes sounded at the Tenth Annual Meeting of the Chamber of Commerce of the United States, held in Washington last week.

The analysis of the general economic situation as presented at this meeting is specially encouraging when viewed from the standpoint of the automotive industry, since the constantly increasing volume of automotive exports during the last few months places it in a position of greater soundness than that enjoyed by some other industries. Fundamentally, however, automotive exports—and consequently domestic sales—will be subject to the same economic forces which affect other lines of business. Until European stability is achieved, complete domestic industrial recovery is not possible. Thus, the American automotive manufacturer has a definite and

practical reason to interest himself in the discussion concerning methods of obtaining European stability.

The necessity for such interest was emphasized throughout the big convention. It was brought home to the automotive industry most closely perhaps, when James R. Howard, President of the American Farm Bureau, pointed out the fact that the American farmer exports more than one half of his total cotton crop, almost one-fourth of his wheat, as well as vast quantities of other cereals and pork products. He then said that for this surplus production the farmer "must have, not only a market, but a profitable market" and that "because that market lies almost exclusively in Europe, the American farmer has a vital interest in the reconstruction of Europe." In this way, he showed that the prosperity of the American farmer is directly bound up with the European situation.

The farmer is one of the largest buyers of automotive products in this country. We have heard much about his "coming back" recently. It is undoubtedly true that the farm market for cars and trucks is again opening up. But it is apparent also, that the farmer will not be buying automotive products to a maximum degree so long as the countries upon which he depends to take his surplus production remain with budgets unbalanced and industry unstabilized.

This point was emphasized by other speakers throughout the convention. C. H. MacDowell, President of the Armour Fertilizer Works, said "The recovery and maintenance of a steady European market for our raw materials is one of our most important problems. . . This nation is still primarily a producer of surplus raw materials and foodstuffs. . . There is but one broad market to-day for our surplus cotton, copper, wheat, oil, coal, packing house products, naval stores, sulphur, timber, phosphate rock and many other things. This market is Europe."

Speaking for the lumber industry, Axel H. Oxholm, chief of the Lumber Division of the Bureau of Foreign and Domestic Commerce, brought out the same idea in this way: "The lumber industry should not forget that although an export trade of 7 per cent in volume seems of small importance, when 93 per cent of the total production is marketed at home, still if the lumber export trade is curtailed or entirely interrupted, this means that the 7 per cent of the total quantity of lumber produced will be thrown back on the domestic market and will seriously upset conditions at home."

These views of American export trade, give to automotive executives an interest in a phase of export that has not been much emphasized in the past. If the opening and broadening of foreign markets is essential to the domestic prosperity of many basic industries in the United States, the automotive industry has a vital interest in lending its aid and support to whatever program seems best adapted to help stabilize those foreign countries which may be expected to absorb our domestic surplus. Only in this way, can the domestic industries, upon whose prosperity the automotive industry depends for progress, go forward rapidly to sound and permanent industrial activity.

European Stability Essential

The general expression at the convention was conservative but optimistic in tone as regards the basis of general business prosperity in this country.

Starting from the basis that European stability is a fundamental of permanent industrial return in this country, the general opinion was that the corner has definitely been turned and that greater stability will continue to be evidenced during coming months.

The increased stability of exchange was noted as a favorable sign, while the recent rise in sterling caused considerable optimism. The comparative failure of the Genoa conference, however, and the unsettling factor of the Russian problem made it difficult to predict the date at which complete stability is to be attained.

Francis H. Sisson, Vice-President of the Guaranty Trust Co., struck the keynote of the general sentiment as regards the present business situation when he said, "Broadly speaking, there has been a decided trend toward slow but steady improvement for several months, and despite the continuance of certain adverse factors, the business outlook is decidedly more promising than at the beginning of the year."

Better Business Assured

This general feeling throughout the business world, as evidenced at this convention, is of great significance to the automotive industry. Our industry has made phenomenal strides since the first of the year. But increased sales and capacity production have been accompanied by conservative buying, conservative financing, and conservative planning on the part of automotive executives. The general upward trend of business, though thoroughly sound, has not been as rapid as that of the automotive industry. It has been so thoroughly founded on a firm basis, however, that good business for the automotive industry, and better business for the entire country is practically assured throughout 1922.

That the automotive executive, however, may visualize briefly the ideas on the general domestic business situation held by leaders in other industries, the following quotations from speakers at the convention are given.

Joseph H. Defrees, President, Chamber of Commerce of the United States:

"Have conditions failed to improve since the close of the greatest war in history now three and one-half years ago? I would hate to think that I would go so far as to aver it. What I must aver is that there has not been sufficient improvement to justify optimism as to the future —to create a feeling of stability as to conditions abroad or as to the effect of those conditions upon this country."

Silas H. Strawn, Chairman of the Board, Montgomery, Ward and Co.:

"The European nations cannot continue to purchase goods unless we purchase theirs. They cannot purchase our raw materials unless they have credit. They cannot establish credit until there is peace. There can be no peace until the reparation controversy is settled. Until then they will maintain large armies and until they reduce the armies they cannot balance the budgets. Until they balance the budgets they cannot stabilize exchange. . . How can there be any solution of international problems unless all the nations interested participate?"

Dwight P. Morrow, J. P. Morgan & Co.:

"With courage, with patience, with tolerance, this great country with its manifold activities should soon pass through its period of depression. In fact, the signs are many that we are already on the upgrade."

Arthur Balfour, Vice-President, Association of British Chambers of Commerce:

"I can say to you that in England certainly, and in some of the other countries, we have seen the worst. We are reaching economic conditions where trade on a proper basis will again be possible, and I am very hopeful that before the end of the year trade will begin to flow in its normal channels."

Franklyn Hobbs, Franklyn Hobbs Co.:

"Those of you who expect to see manufacturing capacity of this country running close to 100 per cent during the

next few years are sure to be disappointed. Don't shout prosperity; work for prosperity; 'The Lord helps those that help themselves.' "

W. Irving Bullard, Vice-President, Merchants National Bank, Boston:

"Unless there is an explosion in Europe May 31 over reparations, the tangle of public finances in that continent —so basic a factor in affecting trade—should be brought much nearer straightening out in the remaining seven months of 1922. With another harvest reaped, the physical state of the nearly half a billion people in Europe should also progress nearer normal."

James R. Howard, President, American Farm Bureau Federation:

"The agricultural gloom of December dispelled by the smiles of May is directly reflected in the mirror of international exchange."

L. T. McFadden, Chairman House Committee on Banking and Currency:

"We have so recently experienced the difficulties involved in deflation that it does not seem necessary to emphasize the need for caution in preventing an over-extension of credit and currency at this time.

"Our banks are doing what they can to control this condition, but banks need the hearty co-operation of those engaged in business and industry. We must hold tenaciously the ground already gained that the Nation's industrial prosperity may be safeguarded, and our progress toward complete reconstruction be not further delayed."

All the great business interests gathered for this convention were seemingly agreed as to the necessity for the United States to play some part in aiding the economic reconstruction of Europe. Several prominent speakers, including John Ross Delafield, formerly Chairman, Board of Contract and Adjustment of the War Department, and W. Irving Bullard, Vice-President, Merchants National Bank, Boston, advocated the cancellation by the United States of the foreign debts owed to it. There was no general sentiment in agreement with this proposal, however.

James R. Howard apparently voiced the almost unanimous opinion of the delegates when he made the more general statement that "the greatest fundamental need is to have exports and imports of goods and services more nearly in balance. This in turn can be accomplished only by a resumption of business activities in countries now disorganized in order that they may have more goods to sell and with which to make purchases of our products."

The lay opinion of the gathering, expressed informally by individuals rather than publicly by speakers, was rather strongly opposed to the cancellation of our foreign debt. A. J. Brosseau, who may be said to reflect the opinion of a typical automotive manufacturer, said that after having heard the economists and bankers speak in favor of the cancellation of the loans and then having heard some manufacturers speak strongly against it, he had come to the conclusion that, at the present time, we do not know enough about the constantly changing conditions, to determine whether we should collect the interest on the debt, or cancel the debt entirely. He pointed out that by refraining from taking radical action during the next three, four, or five years the normal laws of economics would be given some opportunity to function and that at the end of that time we would be in a better position to act upon the basis of sound knowledge. In the meantime, he showed, foreign trade would be possible anyhow.

The international and commercial aspects of standardization and the possibilities of foreign competition during the next few years were discussed. While there were no radically new thoughts brought out, the discussions served to emphasize again the great importance of standardization in gaining and holding foreign markets for American automotive products.

Analysis of foreign labor and manufacturing conditions show that America is in a strong position and that only in a few lines can foreign manufacturers, including German, be expected to compete as to quality and value with American products. D. T. Farham of Knoeppel & Co., discussing this aspect of the foreign situation as related to American manufacture, said that his recent personal investigations show that the American workman is superior in efficiency to the workman of any European country with the exception of Germany. In this case, the efficiency of the workmen is about equal.

He said, however, that it is a mistake to conceive all European manufacturing plants as old fashioned and inefficient. The best plants in England, France, Germany, and Italy, he said, are equal to the best plants in this country and in many cases have added refinements and improvements. This means that eventually all European industry will rise to that same level, although the process will take a considerable length of time.

He pointed out also that one big factor in Germany's industrial success is the widespread and efficient apprentice system which is in operaton and which enables German manufacturers to have constantly on hand a good supply of very efficient and intelligent workers. He also discussed the great industrial organizations of Europe and pointed out the fact that the United States is not specially ahead of Europe so far as highly centralized organization is concerned.

The importance of South America as an outlet for many American products was not brought out at the convention. This is probably because the convention speakers were concerned chiefly with export possibilities of grain and raw materials rather than of fabricated products. The point is mentioned here, however, because the possibilities of the South American continent as the buyer of surplus American products inevitably comes strongly to mind after this discussion of the comparatively unstable condition of many European markets at the present time. Especially does this concern manufacturers of fabricated products such as those produced by the automotive industry.

STARTING from the basis that European stability is a fundamental of permanent industrial return in this country, the general opinion of the business men at the Tenth Annual Meeting of the Chamber of Commerce of the United States was that the corner has definitely been turned and that greater stability will continue to be evidenced during coming months.

"In general, it may be noted that the process of normalizing the industrial situation in Europe is proceeding slowly but steadily," says Dr. Julius Klein, Director of the Bureau of Foreign and Domestic Commerce. "This recovery has meant a gradual improvement in the purchasing power of countries which have long been our best customers—a most encouraging sign from the point of view of American foreign trade, even though it may also be accompanied by a stimulating competition with our trade in certain markets in the Orient and South America."

Highways Must Be Made Self-Supporting

The automotive industry must give attention to highway development or it will find it has been building upon sand. A greater conception of highway importance demands a nation-wide policy of financing and regulation. Highway construction must proceed on a scientific basis in the future.

By James C. Dalton

TWO long forward strides in relation to highway transport were taken at the annual convention of the Chamber of Commerce of the United States which closed in Washington, May 18th. In the order of their importance they were:

Enunciation by Thomas H. MacDonald, Chief of the Bureau of Public Roads, of a new policy for the financing of highway construction and maintenance.

The fact that a highway transport group was set up within the division of Transportation and Communication and an entire session devoted to consideration of the newest means of communication.

These two developments, taken together, mark the opening of a new chapter in the development of the motor vehicle. MacDonald speaks with the authority of the Federal government behind him and he is recognized as the foremost advocate of highway development.

The Chamber of Commerce of the United States represents business in the broadest sense. Its membership includes hundreds of individual Chambers of Commerce in every city of importance in the country as well as hundreds of other trade and commercial organizations. Any message sent out by it carries tremendous weight. Inclusion of highway transport on the agenda of the convention was a distinct concession, for it was one of the few purely American questions considered. Practically the entire program was devoted to a discussion of the effect of European problems upon American business.

Evidence of the importance attached by MacDonald to his statements is found in the fact that he declared before he began that he did not intend to depart from his prepared address because he did not want his statements garbled. His declarations on this occasion were preliminary to a conference next week with representatives of the automotive industry and the National Association of State Highway Officials. Adoption of a nation-wide policy of financing and regulation will be taken up at the meeting May 24 which will be held behind closed doors.

Translated into the simplest terms the contention of MacDonald is that the original cost of highways should be a capital charge against all the property which will be benefited by them while the rental, or maintenance costs, should be paid by the users of the roads.

As a corollary he believes careful attention should be given the transport needs of each locality before the type of highway is determined. When a gravel road will carry all the traffic likely to develop that is the type which should be built. In other words there should be enough vehicle traffic to make the road self supporting from the start. Maintenance, MacDonald declares, should begin the day the road is thrown open. If that is done there need be little fear of destruction. The type of surface can be changed as traffic increases.

Leaders of thought within the automotive industry have arrived at the conclusion that so long as attention is concentrated exclusively upon the production and sale of motor vehicles, the industry is building on a foundation of sand.

They feel that motor transport is in its infancy provided highways are developed upon a systematic basis but that unless this is done they will find themselves with a tremendous amount of highway rolling stock with nothing upon which to roll it.

Agricultural interests are exerting a greater political influence in this country than ever before and the sentiment of the farmers is crystallizing against the building of anything except what they term "farm to market" roads. They have been led to believe that motor vehicle users are concerned chiefly with the construction of great transcontinental highways, many inches deep with cement, on which they can speed from the Atlantic to the Pacific and from one resort to another.

This feeling, unless it is controverted by constructive action, will mean a tremendously adverse effect upon Federal and state aid for the building of good roads carefully thought out in trunk line systems. The farmers will insist upon having this money spent upon the construction of highways which will enable them to get their produce to market most easily and expeditiously.

Deep students of highway building realize that the animosity of taxpayers against good roads must be dispelled and that farm to market roads must reach every corner of the land if motor transport is to have its full development. The importance of MacDonald's opening gun in the campaign is therefore evident. He considers a sound financial policy more important at this time than the regulation of motor vehicles. Federal regulation of post road transport is not practical at this time, he feels.

When asked by the House Committee on Roads what he thought should be done to regulate motor traffic, he said:

"In my judgment we might arrive at a fair taxing of motor trucks employed in commercial trucking by licensing companies to operate over a fixed route on a fixed schedule with a responsibility to the public for the property which they undertake to transport and also for any injury which they might cause to the traveling public."

MacDonald's views on the regulation of motor vehicles are similar to those of E. J. Mehren, editor of the *Engineering News-Record*, another speaker before the highway transport group at the convention here. The cardinal points outlined by Mehren were:

1. That regulation should be encouraging to highway transport and not punitive.

2. That it should protect the rights of road users and prevent abuses.

3. That there should be a minimum of regulation consistent with maximum economic use of the road.

4. That there should be rigid enforcement of motor vehicle laws.

5. That it is desirable, when the traffic warrants, that highway carriers engaged in regular transport service be designated and treated as common carriers and be subjected to common carrier regulation, to the end

a. That the public may be better served, and
b. That the business of highway transport may be stabilized.

6. That common carrier regulations, where adopted, should not be punitive but should permit highway transport to develop its own inherent economies and particularly that it be not artificially penalized and handicapped in favor of competitive forms of transportation.

The meeting of the highway transport group brought out practically all the automotive men in attendance at the convention. They included Alfred H. Swayne, vice-president of the General Motors Corp.; F. A. Seiberling, president of the Seiberling Rubber Co.; F. C. Van Cleaf of the Goodrich Co.; Alfred Reeves, J. M. Marvin and Pyke Johnson of the National Automobile Chamber of Commerce, M. L. Heminway, general manager of the Motor and Accessory Manufacturers Association and A. L. Viles, general manager of the Rubber Association of America.

A. J. Brosseau, president of Mack Trucks, Inc., and a director of the Chamber of Commerce of the United States as well as of the N. A. C. C. presided. He has long been a student of highway economics and he stressed the importance of the meeting in his opening remarks. It was his thought that any message from the United States Chamber would carry great weight throughout the country.

The first speaker was MacDonald. Among the points he made were the following:

"The whole future of our nation will be largely modified and determined by the factor of transportation in the sense of covering all forms of interchange.

"There are no precedents from which we may accurately estimate the cost of providing the necessary improved highways but the financial aspects even now are such as to demand the most careful and scientific policies which may be determined. As the costs accumulate from year to year the increasing demands upon the financial foundation will cause failure unless the governing policies are properly determined and planned for that future.

"No reason can be offered not to plan well for the future for we are yet near the beginning of highway building activity in its major sense.

"There is plenty of evidence that the tax-paying public is rapidly nearing the end of its ability, or at least its willingness, to act further in the capacity of a shock absorber. There is no reason why the highways should not be placed in the self-supporting class. They are not a luxury nor an incidental but one of the indispensable facilities to the life of the nation and the individual in all its phases. The highways are possessed of a real earning capacity and this must be recognized and admitted.

"There is no difficulty in allocating the earnings of the highway between the different services which it performs. This may be accomplished acceptably by fair and impartial study and investigation. Up to the present too many such studies have been made for the purpose of determining a pre-determined conclusion. All the aspects of highway improvement are so modified by the particular and specific conditions of the locality, small or large, under consideration, that he is wise who will not make either general or dogmatic assertions.

"Many of these assertions which have been accepted as almost axiomatic, fall down as soon as examined in the light of real facts. For example, it has been accepted as a to-be-rigorously observed tenet that highway bonds shall be issued for a shorter period than the life of the road.

"Again, suppose that capital is borrowed to establish a business. Is it an evidence of unsound financing that the owner has continued to carry the original investment using his earnings to maintain and to increase the value of the plant by enlargements and betterments?

"The term 'permanent roads' is a fallacy which is responsible for more or less of the unsound theory which has been advanced with reference to bond issues. There are certain of the essentials of road construction that can be so built that the deterioration is so slow that they may be properly termed permanent. Road surfaces of whatever type deteriorate. Maintenance should begin as soon as the surface is thrown open to traffic, and the higher the cost of the road the more careful in detail should be the maintenance.

"There is also the fallacy of the imposition of detailed and arbitrary legal limitations upon the character and weight of the loads which shall use the roads. Proper regulation within certain reasonable legal limits of the use of the roads is an administrative matter and should be so regarded. Even in a single state conditions vary to the extent that loadings which may be carried without deterioration of some road surfaces will inflict untold damage upon others.

"There are many other fallacies which must be cleared away before we can hope to reach sound conclusions as to permanent policies which will justify themselves over a long term of years. Our total expenditures for highway purposes in the United States last year were approximately $600,000,000. This is the maximum expenditure for one year, but even this rate will not satisfy, within any reasonable period, the demand for improved roads.

"In the development of highway transportation the individuals composing the public have equipped themselves with rolling stock to the extent of more than 10,000,000 motor vehicles, to say nothing of the large number of horse-drawn vehicles in use, and the public as a whole is charged with the task of providing the roadbed.

IT must be remembered, in discussing the contention of the railroads that motor vehicles should bear a greater proportion of the cost of highway building, that whereas a railroad's right of way is for its exclusive use, the highway is for the free use of everybody and everybody benefits from it.

Obviously, sound economics demand that we allow each type of transport to develop its utmost economies and find its place in the transport system in accordance with the advantages it offers the public. If an earlier form of transport suffers thereby it cannot be helped.

While it is conceded that motor transport is in its infancy, this fact stands out: The railroads of the country paid approximately $276,000,000 in taxes in 1921 upon an estimated valuation of $19,000,000,000. The motor vehicles of the country paid approximately $262,000,000 in taxes in 1921 upon an estimated valuation of $9,000,000,000.

"There can be no question of the service the highways render to the owner of the motor vehicle privately operated. There can be no question as to the service which is rendered by the highway to operator of motor truck lines and motor 'bus lines. There can be no question that the improved highway serves the real property in the rural districts. There is, although more questions may be raised, a real service rendered by the rural highway to the property within the urban limits. Or, if more acceptable, to the people as a whole within the cities. All foodstuffs originate upon a highway at some place, and the more quickly and directly they can be transported from the point of origin to these people the cheaper will be the cost and the better will be the quality.

"The relative share of the cost of highways may change but it is difficult to harmonize with the tenets of fairness and equity any plan of financing which does not distribute some part of the cost to each of these services.

"A proper financial policy cannot be established unless there is functioning an efficient highway administration. This applies regardless of the unit that is under consideration.

Type of Roadway Surface All-Important

"The selection of the type of roadway surface is the all-important item from the standpoint of the highway service and highway finance policies. The service to be rendered must determine the selection of the type of highway. Such a selection will determine the financial policy for it will provide the basis for the establishment of an annual highway expenditure budget. The major items of the budget will include maintenance, reconstruction and new construction.

"Reconstruction is included separately from maintenance for in the progress of highway improvement the replacement of old surface is usually by a higher type surface and consequently the road is improved beyond its first condition.

"The new construction requirements in the majority of the States are capable of absorbing all the funds that can be made available so that it is in the fixing of this fund that the most care should be exercised.

The budget for the State highway department would, of course, apply only to the State system which in general includes the 7 per cent system. The estimates would determine the amount of revenue needed for the year's program, for the different classes of work. The amounts needed for maintenance and reconstruction will be determined by the examination of the roads in the system, for the administration of the State highway systems has developed to the point where it is possible to determine within reasonable limits the necessary annual maintenance and reconstruction requirements.

Care Needed in Use of Funds

The new construction requirements in the majority of the States are capable of absorbing all the funds that can be made available, so it is in the fixing of this fund that the most care should be exercised, but it should be sufficient to complete the first construction of the State system within the shortest period consistent with good management and the maintenance of competitive prices.

The total amount as well as the division of the total between the three funds will vary in the different States, but it is believed that it will be possible to apply practically the same principles to the raising of the total fund required. It is freely admitted that this suggestion is tentative and subject to revision in keeping with the studies which are now being made. Also the relation of urban expenditures and local expenditures must be given very careful thought. Outside of the cities and towns, however, it appears more than probable that the State systems will be ultimately extended to provide a sufficient mileage of roads to take care of all the main highway transportation needs of the State.

With these qualifications, then, it is believed that a proper financial policy will require first that all of the maintenance funds be met from the revenues derived from the road user; second, that the costs of reconstruction be met from the revenues derived from both the road user and from State taxes, the relative percentages being different for different States and for the different types of roadways built; third, after deducting the Federal aid, the cost of new construction should be divided between the road users and other State taxes from both urban and rural sources.

Distribution of Revenue

Just how the respective revenues for reconstruction and new construction shall be divided between revenues from the road users and other classes of revenues, and how these costs, once apportioned, shall be divided to the several classes of road users and the different classes contributing to the other revenues, must be determined by the most thorough research and investigation, and there are many facts which must be given consideration. It has been stated that the total expenditures for the past year were approximately $600,000,000. These revenues came from the following sources:

	Per cent
Federal aid	14
State road bonds	7
State taxes and appropriations	12
County, township and district taxes and assessments	14
Motor vehicle revenues	19

Federal aid and motor vehicle revenues constituted 33 per cent; the remaining 67 per cent came from other sources, which are either paid directly or will eventually be paid by State and local taxes. It is believed that a very considerable readjustment of these sources of revenues must be made, so that a larger percentage will be paid by the road user and a lesser percentage from State or local taxes. It must be remembered that this statement is not fairly representative of the funds collected directly or indirectly from the automotive vehicles, for our estimates show the following revenues paid during the fiscal year 1921:

Federal taxes paid by manufacturers on passenger cars and motor trucks	$115,546,249
State registration fees	122,478,654
Personal property taxes	52,500,000
Wheel and privilege license	3,636,543
Gasoline tax, 17 States, calendar year 1922, estimated	11,000,000

A total of $305,161,146, or approximately $30 for each car and truck registered during 1921. This total sum, it will be noted, amounts to over one-half of the total estimated road expenditure for 1921.

Consider also in this connection the question of gasoline consumption. It is probable that the total gas consumption for use in operating automotive vehicles is not far short of four billion gallons per year. An advance of one cent in the price of gasoline on the annual consumption would amount to approximately $40,000,000.

Facts as to the character of construction which goes into the road building program must also be given consideration. For over 11,000 miles of Federal Aid roads involving a total cost of over $188,000,000, the surfacing cost is 60 per cent and the remaining 40 per cent is made up of grading 22 per cent, structures 14 per cent, shoulders 1 per cent, engineering 3 per cent. That is, 40 per cent

of the expenditures were for the permanent features of the road and the great part of the expenditures for surfacing can be rightfully considered in the same class, for it is being successfully demonstrated that by supplementary construction, such as the placing of new surfaces, the widening by addition of shoulders, the greater part of the investment can be continually maintained and thus preserved indefinitely. Expenditures of this class fall into the category of maintenance and reconstruction, and if continuance of these two can be relied upon the original investment is preserved indefinitely. Therefore, little fault can be found with the soundness of the financing if bonds are issued for new construction if the original investment is thus continually preserved, and as a matter of fairness it is questioned whether during the period when the public is being called upon for large expenditures for initial construction, whether the attempt should be made to pay for this construction out of current revenues. Rather is it fair and equitable to distribute the cost over a long period of years by bond issues, or else adopt the other alternative of proceeding at a very slow rate with the construction of modern roadways.

Uses of Highways

It will be noted that little has been said as to the uses which are to be made of the highways. It must be remembered that the whole question of highway transportation is in its infant stages. Very careful investigations and studies are now going forward to determine the economic limitations of highway transport, which includes the necessarily adjusted highway construction. We have made rapid progress during the past two years toward such determination, and the suggestions which have been made are based upon an administration of a highway program predicated upon the results and determinations of these scientific researches and investigations. The objective, after all, is to furnish the cheapest possible highway transportation, which involves both the rolling stock and the roadbed.

Mehren followed MacDonald, taking a highly sympathetic view of the indispensable service rendered the public by motor vehicles. His subject was "Practical Highway Transport Regulation" and he argued for sane rules to govern operation.

"There is need right now," he said, "for a new consideration by both interested and impartial parties of the present laws to the end that there may be prepared for the meetings of the Legislatures next winter sound conclusions as to the present statutes and the desirable lines of revision."

Mehren said it was possible to make a strong theoretical case against regulation of motor vehicles as common carriers, arguing that there are sharp differences between motor vehicle transportation and that of steam and electric railroads. The investment in other types of carriers is stable and competition is difficult.

Regulation of Common Carriers

He asserted, however, that the public has determined that common carrier regulation is necessary and that where motor transport is heavy the public is better served by regulated service. He added that regulation offers the possibility of stabilizing the highway transport business by saving it from the destructiveness of uninformed, fly-by-night competition.

Mehren stated that after taking over regulation of highway transport and promulgating rules to govern it, the Nebraska State Railway Commission had relinquished its regulatory powers on the ground that motor transport in that State had not reached the point where common carrier regulation was necessary.

Discussing the contention of the railroads that motor vehicles should bear a greater proportion of the cost of highway building, Mehren asserted that whereas a railroad's right of way was for its exclusive use, the highway is for the free use of everybody, and everybody benefits from it.

"Obviously," he said, "sound economics demand that we allow each type of transport to develop its utmost economies and find its place in the transport system in accordance with the advantages it offers the public. If an earlier form of transport suffers thereby it cannot be helped.

"Naturally, the motor vehicle engaged in common carrier service must pay for the use of the road just as a privately owned and operated vehicle does. A tax graded by extent of the use of the road is the preferable one, and where that does not exist a somewhat higher tax on the common carrier is warranted because of the certainty of greater use of the road. The common carrier must expect to pay a franchise tax."

In the discussion which followed representatives of brick and cement interests contended that there was no such thing as building too good a highway for any particular district and that heavy traffic always followed a good road. Exception was taken to this contention by Van Cleaf, Seiberling, Henry D. Shirley, chief of the Good Roads Board of the American Automobile Association and MacDonald. They asserted that gravel surfaces were often adequate for farm to market highways.

MacDonald inquired pertinently, "What is the earning capacity of a highway?" He indicated strongly that this would be one of the cardinal points in his creed by asserting that it does make a great difference where good roads are built and that the railroads have learned this lesson.

W. K. Hatt of the National Research Council declared that the day of opinions in highway building has gone by, and that construction in the future must be based on a scientific basis. He deprecated the number of organizations engaged in highway work, declaring there was duplication of effort and lack of purpose.

Important Developments Pending

The purport of the entire meeting was that tremendously important developments are pending in relation to highways and that the time has come for every man in the automotive industry to study the question from a broad-gage viewpoint if the future of his business is to be assured. This applies not only to the manufacturer but to the distributor and dealer as well as to the operators of trucks and passenger cars.

Study of the highway transport question has just begun. Its importance as a factor in the industrial life of the nation has been recognized by the Federal government, by Congress and by the most important business organization in the country. Further conferences will be held in Washington and a definite program will be mapped out in which all elements concerned in the building of highways and in the operation of motor vehicles can reconcile their viewpoints.

While it is conceded that motor transport is in its infancy, this fact stands out:

The railroads of the country paid approximately $276,000,000 in taxes in 1921 upon an estimated valuation of $19,000,000,000.

The motor vehicles of the country paid approximately $262,000,000 in taxes in 1921 upon an estimated valuation of $9,000,000,000.

ONE HUNDRED AND TWENTY-FIVE established companies, operating 500 to 600 two and three-place machines, made 130,736 flights, covering 2,907,245 miles and carrying 122,512 passengers in the twelve months from Oct. 1, 1920 to Oct. 1, 1921.

More Manufacturers Adopt Flat Rate System of Service

Factory service managers, members of the N. A. C. C., make flat rate system chief topic of discussion at convention. Nine factories now using flat rates and others preparing similar systems. Question of piece-work for mechanics in connection with flat rates under discussion for first time.

CONTINUED progress is being made in the conventions of factory service managers who are members of the N. A. C. C. The convention held in Detroit last week centered largely on discussion of the problems of flat rates, "pirate parts" and better service to the car owner. This last subject might have been placed first because, after all, all other subjects are subsidiary to it.

Edward S. Jordan, president of the Jordan Motor Car Co.; H. H. Rice, president of the Cadillac Motor Car Co., and O. E. Hunt, chief engineer of the Chevrolet Motor Co., were the speakers of the convention. Aside from the planned addresses, other subjects were taken up for discussion and certain delegates were picked out to lead the discussions.

Recognition of the dealer, dealer service manager and the independent garage is progressing. Three years ago much time was given to criticism of these classes of automotive men, especially the independent garage men. At the present convention the consensus of opinion is that the dealer and the dealer service manager are working along with the industry and in many service problems they have been able to work considerably in advance of factory departments on account of close contact with the customer and a realization of the customer's service problems. Independent garage men are being accorded the benefit of factory information and, in a great many cases, are being given discounts on parts and other benefits that they did not previously enjoy.

Flat Rates for Repair Work

One topic that was of the most interest and is one of the most important is that of flat rates for repair work. Nine factories represented at the convention are working on a flat rate system and practically all the others have in preparation a system of one kind or another to be put in effect upon its completion.

An entirely new subject is that of piece-work for mechanics in connection with flat rates. While there have been a few sporadic attempts to introduce this system, this is the first time it has come up at one of these conventions.

Edward S. Jordan made the first address at the Tuesday morning convention and confined his talk largely to the advantages of fundamental thinking rather than detailed thinking. He said that the service department was related to the sales department and the production department largely by what the sales department promised a customer. He said that if you advertised a thing enough and promised enough, you could make money on it, provided the price is right, but if you promise too much the service department will have difficulty in making good your promises.

He called attention to the fact that service, as it is growing nearer perfection, is receiving more attention and more favorable mention and cited the recent advertisements in national publications and newspapers which mentioned service as one of the features of the automobile to be sold. He strongly advocated a single purpose policy and a production of one model and said that a multiplicity of models in one factory constituted the problems of a multiplicity of factories.

A telegram from the Body Builders' Association, asking for assistance in formulating a body servicing policy and the opinion of the convention on servicing bodies, was referred to a committee headed by S. V. Norton, of the General Motors Corporation.

"Pirate Parts" Defined

A great deal of time was given to the discussion of "pirate parts." Secretary H. R. Cobleigh stated that the Federal Trade Commission had defined the "pirate part" as one which infringed a patent or misrepresented the goods as original parts and therefore the term "substitute parts" should be used on all parts not made by the original manufacturer but not coming under the head of "pirate parts." A great many companies are spreading propaganda through their printed literature and by other means advocating the use of original parts for a car. From the discussion it appeared that most of the service managers felt that the substitute parts evil could only be met by competition as to price and distribution. Harry G. Moock, assistant sales manager of the Hudson Motor Car Co., stated that the Garland Stove Co. had suffered severely from this kind of competition and had practically eliminated it by going right ahead making parts as cheaply as possible and giving them wide distribution.

H. R. Rice, president of Cadillac, gave a reminiscent talk on his experience in the industry and said that service was very much better than most people were saying. In his belief, a few bad examples of service were being held up and a great many good examples of service were being hidden.

The discussion of flat rates was led by F. A. Bonham, of Durant. After relating his own experiences in working up a flat rate system, he went on to say that the need of such a system of selling repairs is so great that many distributors and dealers have gone on in advance of the factories in making up their own schedules.

A show of hands disclosed that nine companies who were represented are actually working on a flat rate system. Really, the only point for discussion was whether to use a flat rate for labor and material or for labor alone. Of the sixteen who were either using the flat rate or had it nearly prepared, twelve were working on flat rates for labor only and the remaining four on flat rates for both labor and parts. Chairman Voyles

told of the Marmon flat rate of $265 for a complete engine overhaul and said that other flat rates were being worked out by a department formed for that purpose.

Some discussion arose as to the cost of identical repairs in various localities. Some thought that the small shop without special tool facilities would take longer to do the jobs and so lose money, but it was generally counterbalanced by the large overhead and the high rents of the large establishments. Mention was made of an independent garage in Louisville, Ky., that had flat rates on all makes of cars and made money on them. Davock, of Packard, said that his company had worked out about two hundred operations on each model of the current cars and that these represented about 75 per cent of the operations.

Piece-Work for the Mechanic

Something practically new in service to the owners is the use of piece-work for the mechanic. Joseph Kenny, service manager of Bishop, McCormick & Bishop, Dodge dealers in Brooklyn, said that this system had been inaugurated on the basis that mechanics were paid 65 cents an hour and allowed so many hours for the job. If they finished in less time they still received the rate for the time given. If they take longer they get no more. In Kenny's opinion, the time on many of the operations will be cut in half under this new system and a great deal of this saving will be later passed to the customer. Fred Schlueter, service manager of the Detroit branch of the Cadillac Motor Car Co., in a discussion later on in the convention said that his mechanics were working on a system very similar to this and that it had worked out satisfactorily and the mechanics would not care to go back to the old system of straight time. Don Hastings, Detroit Hupmobile distributor, operates his shop on the same basis. There was considerable interest in this subject and many questions were asked of the three advocates of the system.

One of the very interesting talks of the convention was that of Don Hastings. He described conditions as he found them when he took over the service part of the business and then told of the improvements that had been made in the building, stock keeping methods and facilities for rendering good service. He said there were two organizations necessary to the rendering of satisfactory service:

1. Selling service.
2. Doing service.

He told of the great help of the flat rate system and said that he had been working on that basis for about five months. He described in some detail his system of handling service to the customer, the policy of free service and replacement and the follow-up on new customers to insure satisfactory working of the vehicle. In speaking of the amount of time that cars were in the shop for repairs he mentioned the fact that nineteen out of twenty repair jobs were in the shop less than a day and that the busiest hours were the first and last hour and a half of the day.

Wednesday's session was opened with an address by O. E. Hunt, chief engineer of the Chevrolet Motor Co. He thought that much real good could be accomplished by considering the service problems of the industry as a whole rather than the problems of the individuals or companies. He spoke at some length on the relation between the service department and the engineering department and said that the owner was not buying a car but was really buying transportation service and that is what the industry had to furnish him. He said that cars in the hands of owners were undergoing a gigantic road test and that one of the duties of the service department was to make reports of this road test to the engineering department so that from the faults observed in this test improvements could be incorporated into the design of future vehicles.

Servicing cars in outlying districts where the company has no representative was one of the topics of discussion. It seems that many companies have a service contract for their product with independent repair shops or garages. A discount is given on parts and sometimes a small discount on the sale of new cars which have in any way been brought about by the independent garage man.

24-Hours' Service Disapproved

The question of twenty-four hours' service, which was advocated by Norval A. Hawkins, did not meet with general approval. A very few service stations in the larger cities are giving either twenty-four-hour service or sixteen-hour service, but most of the service establishments in the smaller towns operate on ten and twelve hours.

The Wednesday afternoon session was devoted largely to the subject of co-operation between the sales and service departments. The topic was opened by F. J. Wells, of Pierce-Arrow, and several speakers gave their ideas as to methods of making this contact closer. It developed there was much need for co-operation with the engineering department in the planning of new designs. Clyde Jennings, editor of *Motor Age*, was called upon as having views which were not biased by any department affiliation. He said that the village blacksmith was the forerunner of the service manager of to-day and that it was up to him to build for himself a place in the hearts of his customers that had inspired Longfellow's great poem.

The last topic to be taken up at the convention was the planning of future meetings. It was suggested that the May meeting be held each year in Detroit and the November meeting be held in different cities. Accordingly Chicago was selected for the November convention.

Davis Producing a Smaller Six

THE George W. Davis Motor Car Co. is now in production on a new six-cylinder car to be known as Model 61, equipped with a five-passenger phaeton body. The new car is similar to the larger model 71, but has a 114-in. wheelbase, as against 120 in. and uses the new Continental 6Y engine with 3⅛-in. bore and 4¼-in. stroke, which has a displacement about 10 per cent less than the engine in the larger car, but is said to develop 50 hp. at 2600 r.p.m. This engine has a four-bearing hollow crankshaft arranged for pressure lubrication and a chain drive for camshaft and generator. The same make of component parts are used for axles, clutch, ignition, etc., as are used in the larger six, these being Timken, Borg & Beck and Delco respectively. The wheels now used as standard equipment are Disteel, five of which are furnished, the spare being carried on a bracket at the rear of the frame. The 31 x 4-in. tires are 1 in. smaller in diameter than those used on the larger car.

The road weight of the car is given as 2645 lb. The price is $1,195.

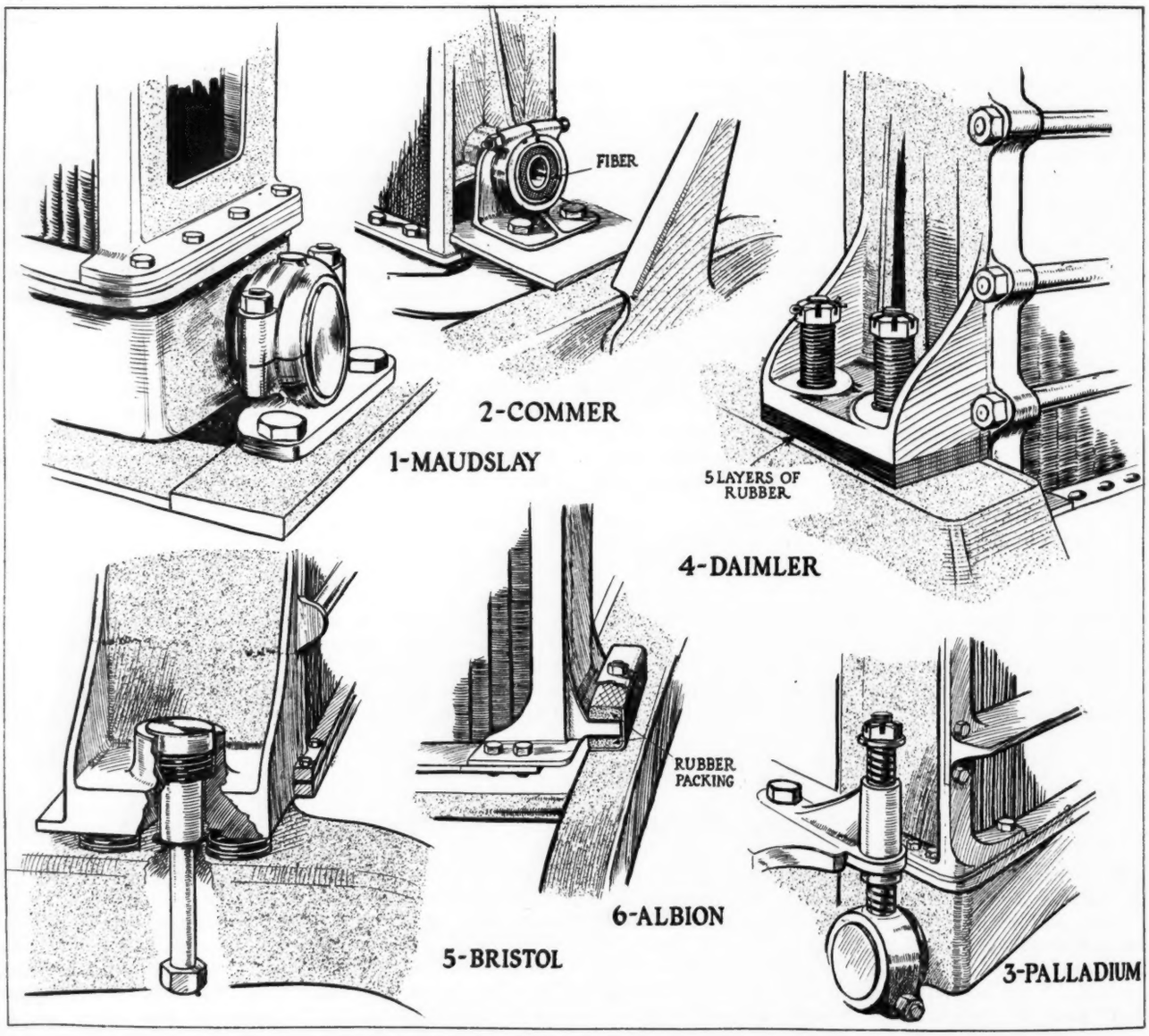
Protecting Truck Radiators Against Frame Distortion

British truck makers employ various mountings to protect radiators from torsional stresses and vibration. Maudslay arrangement closely approximates ideal. Albion is good example of inexpensive flexible mounting.

By M. W. Bourdon

THE need for protecting the radiators of truck chassis against the ill effects of frame distortion should be obvious, and yet one not infrequently observes radiators bolted down rigidly to the front or side members, with results which are made evident in due course by "weeping," if not well-defined leaks which cause needless expenditure.

There is a close approximation to the ideal in this respect in the Maudslay arrangement shown in Fig. 1, where a spherical trunnion at each side forms the support. Admittedly this is a comparatively expensive mounting, with



1—Maudslay radiator supported by spherical trunnion at each side. 2—A projecting boss, hollow and supported by webs, on each side plate of the Commer radiator. 3—Palladium employs a parallel-sided boss on the bottom tank. 4—Daimler uses two bolts and five layers of rubber to prevent distortion. 5—Bracket extension on Bristol rests on three short helical springs. 6—Inexpensive type of mounting on Albion

its machined, parallel-sided boss integral with the cast bottom tank, its bronze bushing with a parallel bore and hemispherical outer surface, and its two-part bracket machined within to suit the bushing. But apart from failing to afford any insulation from vibration, it meets all requirements, being able to take care of frame distortion in any direction and allowing the radiator to be easily dismounted.

Lacking some of the characteristics of the Maudslay is the Commer arrangement (Fig. 2). In this case there is a projecting boss, hollow and supported by webs, on each side-plate of the radiator. Encircling the boss is a thick bushing of fiber, itself encircled by a steel bush, the whole being carried in a split bracket with a pinch bolt. Doubtless the fiber bushings, with their slight inherent flexibility, permit variations in alinement between boss and bracket, but they cannot fail to convey torsional stresses from one to the other when road surface inequalities are pronounced.

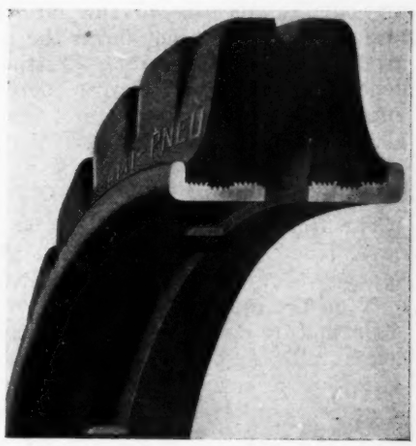
The Palladium scheme (Fig. 3) embodies a parallel-sided boss on the bottom tank, located within a split clip which has an upward extension supported between square-section helical springs by a bracket projecting forward from the front cross-member. The only provision for counteracting frame distortion is the clearance of the clip extension in its bracket—a feature tending, despite the springs above and below, to permit hammering from vibration, and consequently rapid wear.

The remaining three examples exemplifying British practice eliminate trunnion supports and depend upon intervening springs or rubber between the bracket extension of the radiator and the frame. The two bolts at each side in the Daimler (Fig. 4) and the single ones at each side in the other two cases have plenty of clearance in the holes in the bracket through which they pass. Of these three arrangements, the Bristol (Fig. 5) seems most likely to retain its original flexibility, for it embodies no rubber packing liable to perish, the bracket extension at each side resting upon three short helical springs located by recesses in the lower surface of the bracket. The sketch of the Albion (Fig. 6) is self-explanatory and illustrates what is certainly one of the least expensive of flexible mountings.

Semi-Pneumatic Motor Truck Tire

A SO-CALLED semi-pneumatic tire for motor trucks which, it is claimed, possesses the characteristic endurance of the solid rubber tire and much of the cushioning quality of the pneumatic, is being brought out by the B. F. Goodrich Rubber Co. Cushioning and shock-absorbing qualities are provided by the air chamber running through the center of the tire, as clearly shown in the sectional view herewith.

The outside design of the tire also presents features of interest. A groove molded in the tread helps to prevent skidding. In addition there are a number of side blocks on the tread, designed to give traction in soft going. The side slots between the blocks add to the resilience of the tire and are claimed to materially reduce gasoline consumption by breaking up and reducing the tractional wave. This tire fits the regular S. A. E. wheels and may be applied with the regular solid tire press.

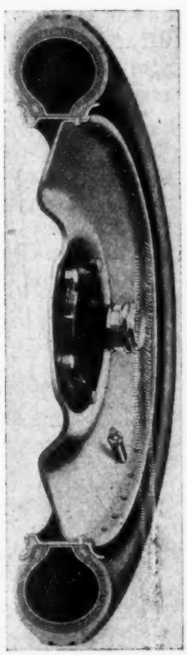


Sectional view of Goodrich semi-pneumatic tire

New Disteel Wheel

A NEW design of disk steel wheel has been brought out by the Detroit Pressed Steel Co. It has an outside valve stem, takes a standard tire tube and is claimed to be lighter than a wood wheel with demountable rim. The wheel is composed of a tapered disk curved inwardly for some distance and having a rim riveted to it so that the side ring is inside instead of outside the rim.

It is stated that on account of its much lighter weight the new wheel can be produced at materially lower cost. A certain amount of flexibility results from the curvature of the disk.



Cross-section of new design Disteel Wheel

The outside valve stem used with this new wheel is that of any standard inner tube, so that any air chuck may be used. There is sufficient room between the stem and disk to permit of the use of the largest size air hose chuck.

The reduction in the weight of the wheel will result in lessened tire wear.

A RESIDENT of South Africa has written that, in his opinion, the success of the American manufacturer in that field may be summed up in the words "Price and Propaganda." With regard to the former he says that if the British manufacturer cannot compete in prices with the American then the overseas trade is lost to them forever, and that "against the foreign product the British manufacturer enjoys a three per cent Customs preference, a sentimental preference equal to at least ten per cent, and the advantage of lower freight rates and shorter distance compared with the United States. The exchange advantage will disappear and possibly the sentimental preference, too, unless kept alive by well-directed propaganda."

With regard to propaganda he says: "American cars are forever in the limelight with consumption tests, reliability trials, speed races, endurance "stunts" and nonstop road runs. The American exporting companies organize publicity campaigns on national lines and share half the costs with their distributing agents. The latter are responsible for their own local advertising." In closing he says that the British may yet recover lost ground.

Novel Starter Armature Eliminates Use of Soldered Commutator Joint

Closed end of armature coil located at what is usually commutator end. Separate commutator dispensed with. Two armature bearings are placed closer together. Simplified construction greatly reduces production cost.

THE coils of starting motor armatures ordinarily consist of copper bars drawn out and cut off so that one bar forms a complete turn or coil. At the commutator end the ends of this bar are soldered to the riser lugs of the commutator. This soldered joint has sometimes given trouble. The starter, as a rule, operates only for very short periods, but while it is operating it draws very heavy currents. Any imperfection in the joint between the armature bar and the commutator may add materially to the internal resistance of the armature and thus cut down the maximum value of the armature and field current. As the torque of the starter depends upon the armature current, the magnetic flux and the armature conductors, its maximum value will also be materially reduced.

Separate Armature Unnecessary

The Splitdorf Electrical Co. some years ago started development work to overcome this difficulty and incidentally secure several other advantages. In the Splitdorf design, as illustrated herewith, the closed end of the armature coil is located at what would usually be the commutator end. A separate commutator is dispensed with and the brushes bear directly on the outer faces of the armature bars, which are turned down for that purpose. The tangs of the armature bar beyond the core do not run parallel with the armature shaft but at an angle thereto, the upper part of the bar in one direction and the lower part in the opposite one.

At the rear or driving end of the armature the bars must, of course, be joined together. The ends may be placed in a ferrule and then soldered, and it is claimed that a soldered joint can be made much better in this way than where the ends of the bar lie in a deep groove in the commutator lug. It is planned, however, to do away with soldering entirely and make the joint by electric arc welding.

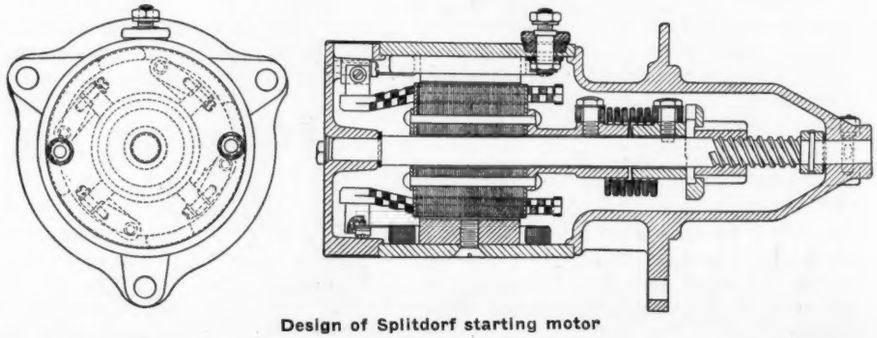
The ends of the armature bars therefore serve as commutator bars. They are arranged helically and are separated by air spaces. The carbon brushes get onto any particular bar gradually, and this, in connection with the absence of mica insulation between bars which makes projecting mica ridges an impossibility, is claimed to obviate all danger of chattering of the brushes. The brushes may also be arranged to bear against the ends of the bars, or against both the ends and the outer edges, but the plan here indicated is probably the most practical one, as it eliminates the problem of providing in the brush construction for the end play of the armature.

An incidental advantage of this arrangement is that it permits of placing the two armature bearings much closer together, providing a more substantial support for the armature, reducing the over-all length of the starter, and—in the case of the usual flange mounting—the overhanging length.

Another improvement made has to do with the armature shaft and reduces its cost of construction. The usual method of building up an armature core consists in taking a shaft turned with a shoulder and having a keyway cut in it. The core disks are then pushed over the shaft, pressed together in a press and secured on the shaft by "staking" or by the use of a clamping nut engaging threads on the shaft. Turning down of the shaft from stock of a diameter equal to the diameter of the flange against which the armature end plate bears involves considerable machine work. In the Splitdorf design, as shown in the sectional view, the shaft is of uniform diameter almost from end to end. At both ends the diameter is slightly reduced for the bearings and at the driving end the screw thread for the Bendix drive is turned directly on the shaft. The core disks are punched with three holes for driving pins through them and are assembled with end plates of heavier stock and with the driving sleeve of the Bendix drive, as shown. The core has clearance on the shaft and the armature can be completely finished before being put on the shaft. Thus the core is easier to handle in winding and occupies less space in storage and especially in the baking oven.

The reason for turning the thread for the Bendix drive directly on the shaft is that this permits of the use of a pinion with a smaller number of teeth, thus giving a maximum reduction between the starter and engine.

Two other advantages claimed for the design of starter motor here described are that the cost of a separate commutator is eliminated and that carbon dust cannot accumulate on the commutator and cause short circuits, as there is such a large space between the commutator bars and any small amount of carbon dust that may be formed is thrown off by centrifugal force.



Design of Splitdorf starting motor

Do Overhead Camshafts Increase Efficiency in Engine Operation?

Part I

This design usually leads to symmetrical engine with high degree of accessibility. Contrary to general impression, there is no inherent reason why an engine of this type should not operate noiselessly. Four American makers use overhead camshafts, which are common in European practice.

By P. M. Heldt*

FOR a number of years there has been a gradual trend toward the use of overhead valves in automobile engines. This movement probably was accelerated by the success of aircraft engines with this valve arrangement, as well as by the publicity given this construction by its almost universal use on racing engines. That valves located directly in the cylinder head are not merely a fad but possess practical advantages may be concluded from the fact that practically all of the tractor engines brought out the past several years have the valves so located.

Valves in the cylinder head can be operated either by tappet rods extending up one side of the engine or else directly from an overhead camshaft. There is a third method, which consists in arranging the valves at right angles to the cylinder axis and operating them from a camshaft in the crankcase through the intermediary of long, double armed levers, as exemplified in the Duesenberg engine. This arrangement, however, necessitates the provision of a valve pocket on top of the cylinder head, and in most respects—especially as regards the form of the combustion chamber—it resembles more the L head engine than the true valve-in-head engine which has no valve pockets.

The advantage of the valve-in-head engine over the L and T head is that the combustion space of the former has a much more favorable form. It has less cooling area in proportion to volume than either of the other types, in consequence of which the heat loss to the jacket is reduced, and, besides, the distance from the firing points to the most remote part of the firing chamber is smaller, so that the flame is propagated through the entire mass of the combustible charge in a shorter space of time, which also tends toward increased power and higher fuel economy. The decrease in the loss of heat to the water jacket facilitates the problem of effective engine cooling, and the simple form of the combustion chamber also helps in this connection. The combustion chamber, that portion of the cylinder casting subjected to the highest temperatures, is more symmetrical, and the cylinders therefore are less likely to be distorted by unequal expansion. There is also less likelihood of the presence of considerable masses of metal in the upper part of the cylinder casting, which would be difficult to cool, as well as of the formation of steam pockets.

While considerable emphasis is here laid on the advantages of the valve-in-head construction from the standpoint of engine cooling, the majority of designers who have adopted the practice have done so because they expected from it increased engine power and reduced fuel consumption. The inlet as well as the exhaust valve passages can be made shorter and more direct than in any other cylinder form, and the overhead valve type of engine lends itself particularly well to high speed operation. It is also claimed by some that there is less knocking

*Paper to be read before the summer meeting of the Society of Automotive Engineers, White Sulphur Springs, June 20-24. For information concerning British practice the author is indebted to M. W. Bourdon, British correspondent of AUTOMOTIVE INDUSTRIES.

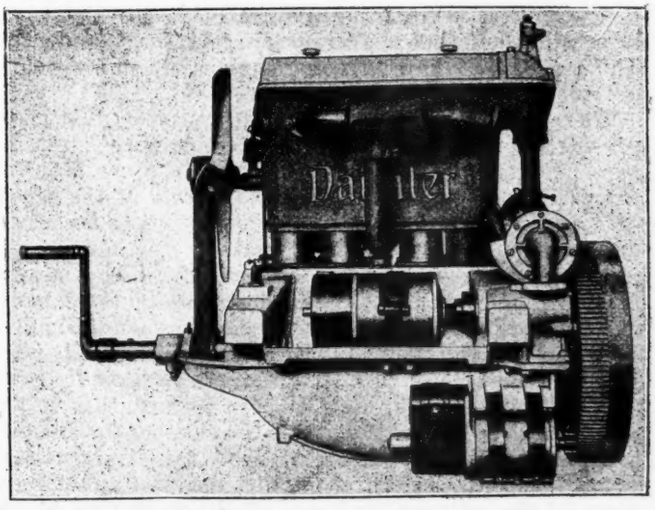


Fig. 1—Mercedes four cylinder engine with rear end camshaft drive

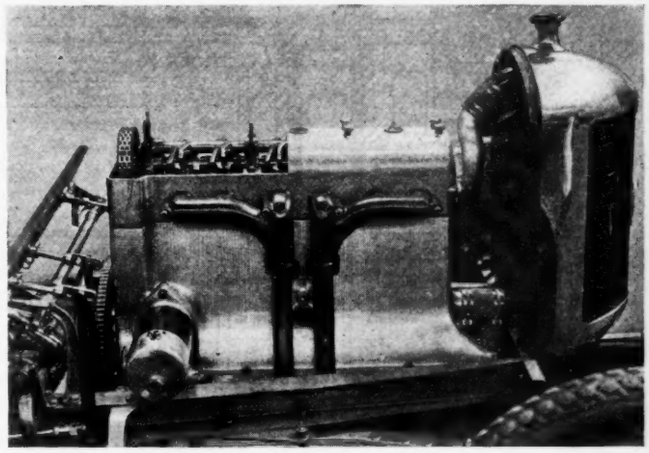


Fig. 2—British A. C. engine with chain-driven overhead camshaft

tendency with this type of engine, and in view of the greater ease of effectively cooling the combustion chamber this claim does not sound altogether unreasonable, but no definite proof of it seems to be available.

The tendency toward overhead valve engines is reflected by the analyses which are being made annually of car specifications. In 1914 only 6 per cent of the cars listed had such valves, while in 1922 the proportion had increased to 31. This applies to American cars. In Europe, the valve-in-head engine has made progress particularly the past year. Disregarding engines of the sleeve valve type, 32 per cent of European models listed for 1922 had overhead valves, as against 20 per cent of those listed for 1921. Many British makers seem to be in a state of transition, offering cars with both valve-in-head and side pocket valve engines this year, and if the public takes kindly to the newer design there will undoubtedly be another increase in its representation next year.

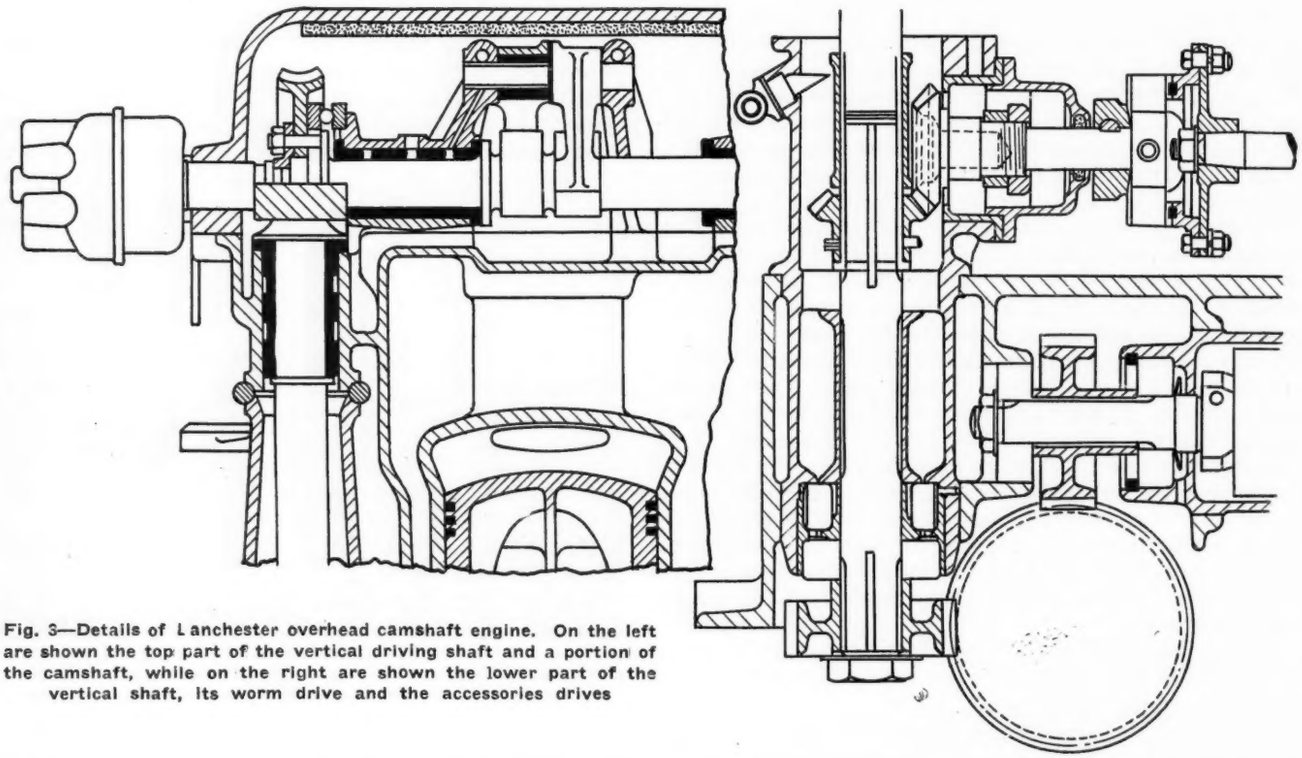


Fig. 3—Details of Lanchester overhead camshaft engine. On the left are shown the top part of the vertical driving shaft and a portion of the camshaft, while on the right are shown the lower part of the vertical shaft, its worm drive and the accessories drives

Most engines of this type used on passenger cars have the valves operated by tappet rods, whereas most racing and aircraft engines with the valves in the head have overhead camshafts. It is interesting to analyze the reasons for this difference in practice.

The side rod method of overhead valve operation is the oldest, at least in the sense that it was first to gain any considerable degree of popularity. In one way it seems also the simplest and most natural; for all that is wanted for the valves is a reciprocating motion, and what means for transmitting a plain reciprocating motion over a moderate distance could be simpler than a pushrod? However, when engines get up to high speeds the problems arising as a result of inertia effects must be considered, and it is precisely to permit high speed operation that overhead valves are generally resorted to. The increased power output results directly from the increased operating speed and the gain in economy is also in part dependent upon it.

In discussions of racing and ultra high speed engines the statement has often been made that what limits the speed of the engine is the inability to close the valves promptly at extreme speeds. The inertia of the valve reciprocating parts then becomes so great that it is practically impossible to get the cam followers to follow the contour of the cams. The force necessary for closing the valves, which is furnished by the valve springs, is greater in direct proportion to the weight of the valve reciprocating parts. In one way there is almost no limit to the force which can be obtained from a coiled or other form of spring, but in practice, if the pressure of the valve spring is increased, generally the stress in the material of the spring is also increased, with consequent greater risk of spring breakage. Besides, a very stiff spring puts great stresses upon the valve itself. For these reasons it is generally a much better plan to reduce the weight of the valve reciprocating parts in order to permit of higher operating speeds than to increase the stiffness of the springs. Therefore, for extremely high speeds, to reduce the stress on the valves and their springs, motion should be transmitted in the rotating form as close to the valves as possible, and then converted into reciprocating motion. This makes it plain why racing engines are so frequently provided with overhead camshafts.

There is another aspect of the valve problem that needs consideration, particularly in connection with a view to passenger car applications, where engines are required to operate without appreciable noise. One of the causes of noisy operation under certain conditions is the clearance which must be given the valves—particularly the exhaust valves—when cold. The need for this clearance is due to the fact that as the engine heats up the exhaust valve stem expands materially, much more than the engine as a whole, and it must be given freedom to expand or the valve will not close, which is generally quickly followed by disastrous results. It has been argued that if the cams are directly over the valves the chances for unequal expansion and the consequent need for clearance are greatly reduced. In this connection the relative temperatures of the cylinder block and of the valve rods at the side are a factor. For instance, if the cylinders are air

cooled and the valve rods are so located that they are not greatly influenced by the heat of the cylinders and remain relatively cool, it is conceivable that the cylinders will expand much more than the rods. This difference in expansion has the same effect as the expansion of the valve stems, and, therefore, additional clearance must be allowed the valves. On the other hand, if the engine is water cooled and the valve rods extend up through enclosed spaces within the cylinder block, rods and block will be of substantially the same temperature and there will be no difference of expansion. Noiseless operation does not count particularly in racing and aircraft engines.

There seems to be a general impression that it is difficult to make overhead camshaft gears operate noiselessly. Just why this should be so—if it is so—is not immediately apparent. Any noise in cam gearing depends on the one hand on the cam outline, and this could be made the same as in engines with the camshaft in the crankcase; and, on the other hand, on the mass of the reciprocating parts, which, as already pointed out, can be, and usually is, considerably less than in a valve-in-head engine with valve rods extending up the sides of the engine. It may be that the impression was created in the early days when overhead camshafts were exposed. In all modern engines of this type not only the camshaft but the whole valve mechanism is enclosed, so that from this point of view the construction should be as easy to render noiseless as an engine with camshaft in the crankcase.

If there is justification for the belief, one reason probably is that there are generally more wearing contacts in overhead camshaft gearing than in the more conventional type of valve gear. At each of these contacts wear will occur, and the play or slackness in the camshaft operating train therefore will increase more rapidly in an engine of this type than in the ordinary L-head engine. Every time the nose of a cam passes from under the cam follower there is a tendency—which is more pronounced in the case of a four-cylinder engine than in that of an engine with more cylinders—for the camshaft to jump ahead and take up the slack of the drive, thus creating noise.

In connection with the older engines with side tappet rods the rapid wear of the tappet lever bearings is unpleasantly remembered. The only means of lubrication of these tappet levers was an oil hole, and the excessive wear was probably due not so much to inadequacy of the lubricating means as to neglect to make use of them. Presumably, with the newer engines of this type, which have wick or even force feed lubrication, this difficulty has been overcome. Of course, with some of the overhead camshaft engines tappet levers are also used, but they are now always inclosed, and therefore can be effectively lubricated. The difference is therefore not one of camshaft location but rather of valve actuation and of details of construction.

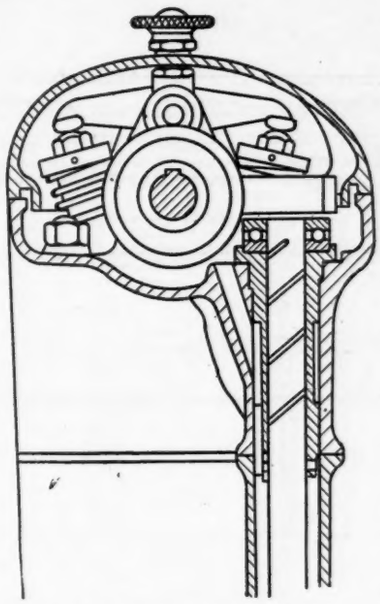


Fig. 4—Ansaldo camshaft drive

Another thing in favor of the overhead camshaft is that it generally leads to a very symmetrical engine with the accessories so located that they are quite accessible and with the sides of the engine comparatively free from obstructions.

From the standpoint of manufacturing cost the overhead camshaft is not a very attractive proposition. The provisions which must be made for the complete, oil-tight enclosure of the camshaft, for its lubrication, the enclosure of the drive between members of which one is carried by the crankcase and another by the cylinder head, and the lubrication of this drive, involves considerable expense. There are certain ways of manufacturing overhead camshaft engines comparatively cheaply, but these engines are likely to prove unsatisfactory for one reason or another.

A design of an overhead camshaft engine should be judged from the maintenance standpoint on the basis of the ease of removal and replacement of the cylinder head for the purpose of carbon removal, and of the ease with which the valves can be ground. In other types of detachable head engines the disassembling and assembling work connected with decarbonization of the cylinders is practically the same as that connected with the grinding in of the valves, but this is not necessarily the case, and the merits of an otherwise well thought out overhead valve engine may be greatly detracted from if it requires an excessive amount of disassembling and re-assembling in order to grind in the valves.

The overhead camshaft engine has not as yet made much headway in this country, only four cars at all well known having such engines at present. In Europe, on the other hand, many of the leading makes now employ this type of engine, including Lanchester, Napier, Wolseley, Straker-Squire and Leyland in England; Bugatti, Farman and Hispano in France; Ansaldo and

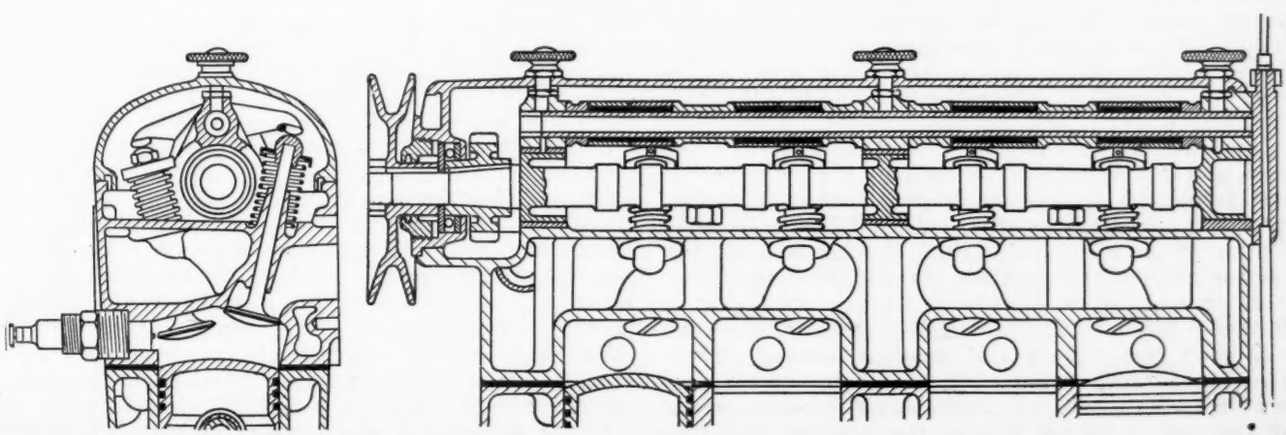


Fig. 5—Ansaldo engine cross section and side view

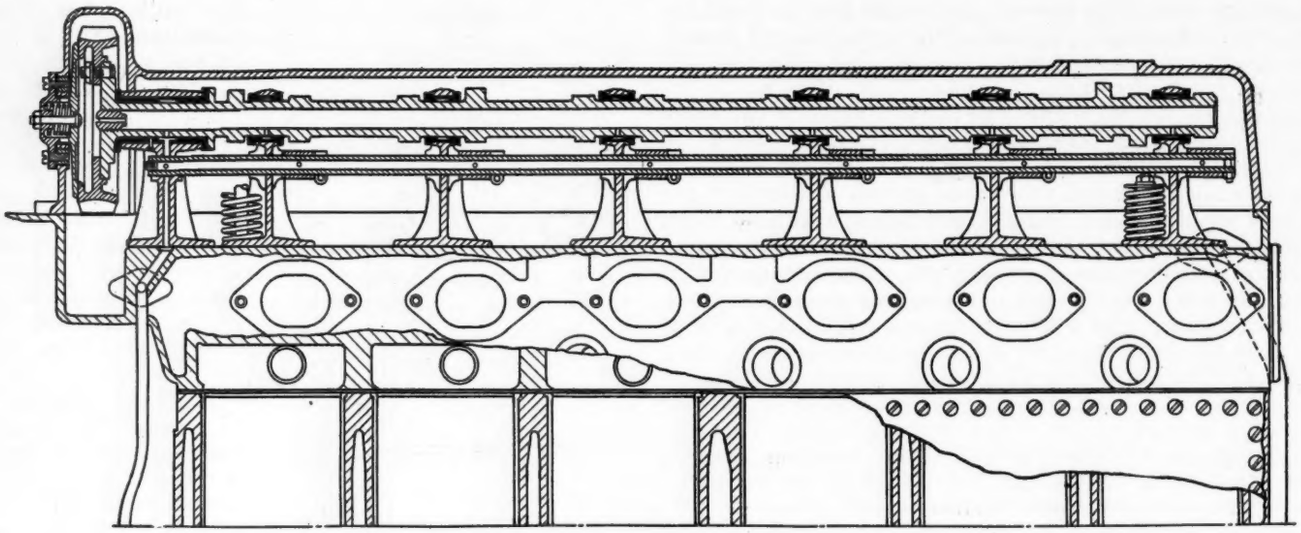


Fig. 6—Napier overhead camshaft

Diatto in Italy and Mercedes and Szawe in Germany. As a passenger car engine the overhead camshaft type is practically an after-war product, while motor truck engines with overhead camshafts were used by several manufacturers in Germany prior to the war.

The writer assumes that the four American overhead camshaft engines, the Wills Sainte Claire, the Leach Biltwell, the Duesenberg and the Frontenac, are well known to the reader, as all have been described in these columns within the past several months; consequently, in the following only overhead camshaft engines of foreign design will be considered.

In connection with the drive the question of its location, at the front or rear, comes up. It is the almost universal practice to have the camshaft drive at the front, and this location is practically standardized. However, it is well known that trouble has been experienced with camshaft drives in the past several years, and there is some suspicion that the fact that the drive is at the front, where it is subjected to the effects of torsional vibration of the crankshaft, has something to do with this. Since the introduction of engines with six and more cylinders running at high speeds a great deal of trouble has been caused by torsional vibration. Owing to the periodic impulses in a gasoline engine, the engine naturally tends to accelerate and decelerate periodically, and the flywheel is provided to minimize these speed fluctuations. The greatest fluctuations in speed occur at the forward end of the crankshaft. If the natural period of vibration of the shaft happens to coincide with the periodicity of the impulses received by this end of the shaft, a periodic torsional rocking motion is superimposed upon the regular rotary motion of the shaft. After each explosion in one of the forward cylinders the crankshaft will jump ahead, only to snap back the next moment. This effect, of course, occurs only at certain critical speeds of the engine, and in engines with exceedingly stiff crankshafts these speeds may never be reached in regular operation. But where a critical speed is reached in the regular operation of the engine it is quite obvious that it must be rather hard on the camshaft gears if they are located at the forward end.

Mercedes has located the camshaft gears at the rear for a good many years and another German maker, Szawe, has recently followed the example. If there is any part of the crankshaft that rotates more uniformly than the rest it is that part at the flywheel, and this therefore would seem to be the best part from which to take the camshaft drive. The objection has been made to this practice that it renders the camshaft gears much less accessible. This is true, but if it renders the gears at the same time invulnerable, what does it matter? With the light work the camshaft gears really have to do it should not be at all difficult to provide a set of gears that would last the life of the engine, and in that case the question of accessibility would not arise.

The writer believes that anyone contemplating the manufacture of an engine with overhead camshaft should give the location of the camshaft driveshaft the fullest consideration, especially if the engine has six or more cylinders. From the standpoint of silent operation also the rear drive has something to commend it, and conditions are still further improved if the fan is driven from the forward end of the camshaft, making the resulting or total torque on the camshaft non-reversible and thus eliminating the cause of noisy operation referred to in the foregoing.

One of the methods of driving an overhead camshaft is by silent chains, and this has been used in a few cases for a good many years. One of the four American overhead camshaft engines, the Frontenac, has this form of drive. From the manufacturing standpoint the chain drive is very attractive, as evidently all that is required is a sprocket or chain wheel on the crankshaft and another on the camshaft and a chain to connect the two. In practice, however, various difficulties crop up which have militated against the more extensive use of chains for this purpose. A single chain between the crankshaft and camshaft is unsatisfactory, because it would have to be abnormally long, and with the wearing of the links or the "stretching" of the chain would whip and be likely to hit the wall of the casing, unless the latter was made with a great deal of clearance space. Two chains, therefore, are generally used, one transmitting the motion to a short intermediate shaft, which may be the fan shaft, and the other transmitting it from this shaft to the camshaft. This does not dispose of the question of chain adjustment, however. One way of solving this problem consists in driving not directly to the camshaft but to a short shaft at the end of it which drives the camshaft through a Hookham joint, and then providing both this short shaft and the intermediate or fan shaft with an eccentric adjustment. Another consists in the use of chain tensioning idlers.

In the British A.C. six-cylinder the camshaft drive is by means of a long silent chain direct from crankshaft

to camshaft, with a spring-loaded jockey pulley to take up slack. The drive is at the rear end of the engine (see cut). The ill-effects of the intermittent torque which the chain must withstand, even in this six-cylinder engine, are reduced in degree by reason of the water circulating pump being located at the end of and driven directly by the camshaft; the load represented by the pump being positive and uniform puts the torque always above the zero line, and though it does not eliminate or even reduce the torque variations due to cam-succession it maintains a positive pressure between the teeth of sprockets and chain. For this reason this pump location seems to be worth considering no matter what form of drive is used and particularly on four-cylinder engines.

On the Wolseley engine there is a short silent chain for transmission to an intermediate shaft directly above the crankshaft. Because of the shortness of this chain the troubles of whipping, etc., are absent and no means for tensioning the chain are required.

Spur gear drive has done excellent service in racing engines. This involves a train of spur gears extending up the front of the engine, and one would expect it to be rather difficult to make such a train quiet, even if helical teeth were used. In racing engines the shafts of the intermediary gear are mounted on ball bearings, and this would no doubt also be required in high class passenger car engines, which would make the drive rather expensive. Another objection to the spur gear train is that since there is a considerable number of wearing surfaces, once the gears begin to wear seriously there will soon develop a considerable backlash, and it would then probably be next to impossible to keep the drive quiet. The gears might be so liberally proportioned that wear would be a negligible quantity, but the high cost and the rather unsightly appearance of the large gear case would remain.

An advantage shared by the two methods of drive is that they require no thrust bearings, whereas all of the other more common forms of drive require such bearings. These involve considerable expense, including not only the cost of the bearings themselves but also the cost of machining the mountings and fitting the bearings.

A form of drive for overhead camshafts that has met with success and is now used on several well known makes of cars is that through helical gear with axes at right angles, or that improved form of the same—the worm drive. The so-called spiral gears were formerly largely used for the camshaft drives of stationary gas engines and possess as their most valuable feature their silent operation. If made of liberal size and provided with adequate means of lubrication they give satisfactory service, but as there is theoretically only point contact, the unit pressure at the contact surface is quite high and if the lubrication is not dependable the backlash is apt to increase rapidly. It is for this reason that several British manufacturers use true worm gears for the drive. Worm gears differ from helical gears in that the face of the worm wheel is throated, conforming to the circumference of the worm, whereby increased bearing surface is obtained.

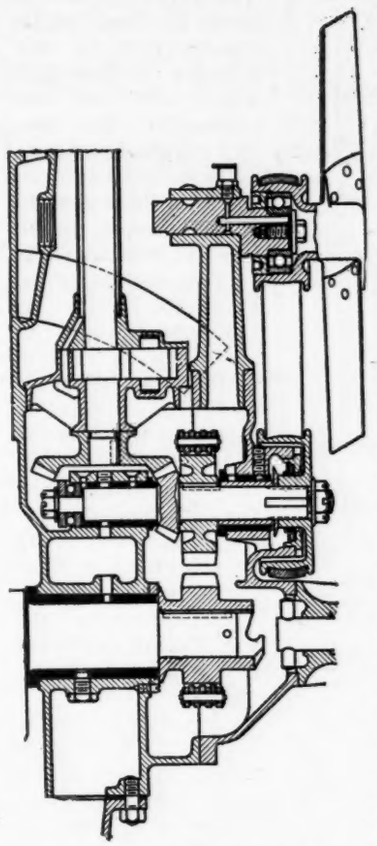


Fig. 7—Wolseley overhead camshaft drive

One advantage of the helical gear or worm drive is that the vertical shaft is offset from both the crankshaft and the camshaft and therefore can have extensions for accessories coupled to it at both top and bottom. With a bevel gear driven intermediary shaft extra gearing is required for accessories at the bottom at least.

It is probably between the worm gear and the spiral bevel gear that the chief competition for supremacy in the overhead camshaft field will arise. The strong and the weak points of the two are practically the same. Both are absolutely quiet in operation—which constitutes their strong point—but both require means for accurate adjustment of their mesh if they are to work satisfactorily. The advantage of the worm in respect to greater handiness for the driving of accessories in certain locations is offset by its somewhat lower efficiency and its lack of symmetry.

An overhead camshaft is one of the features of the six cylinder aluminum engine brought out by Napier of England some years ago. The camshaft is hollow and is supported in seven cast brackets bolted to the aluminum cylinder head. It is located centrally above the cylinders and the valves are staggered, one being on one side of the camshaft and the other on the opposite side. There are two rocker shafts supported on the same brackets as the camshaft, and the rockers or valve levers extend underneath the camshaft and are so arranged as to give a greater lift to the valves than the height of the cam nose.

The camshaft drive on this engine is by worm gearing.

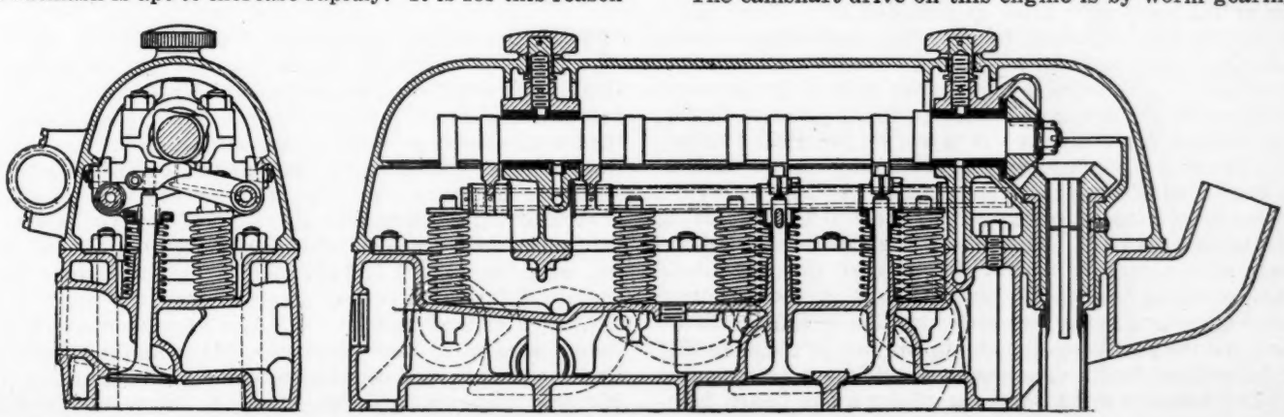


Fig. 8—Sectional views of Wolseley cylinder head and valve cover

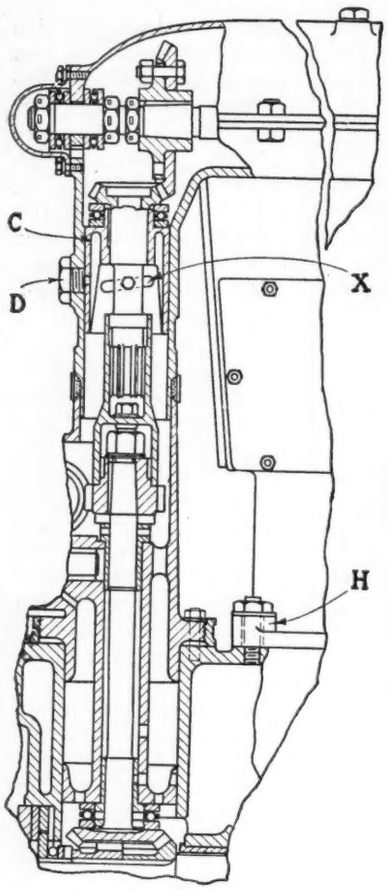


Fig. 9—Bentley camshaft drive

The vertical shaft is made in three parts, one carried by the housing at the forward end of the crankcase; the second carried by the cylinder head and the third an intermediate shaft secured to the top and bottom parts by flanged couplings. From the bottom of the vertical shaft the oil pump is driven, while the generator and magneto drive is taken off the vertical shaft at the joint between the bottom and the intermediate section, the worm being combined with a coupling flange.

In connection with the Napier camshaft drive a description may be given of its camshaft brake, which is a feature found only on a few high grade engines. There is a possibility that such a camshaft brake is more necessary in an engine having a worm drive for the camshaft than in an ordinary L head engine with direct spur gear drive to the camshaft, owing to the fact that the worm drive may permit more backlash in the drive. The object of the camshaft brake is of course to prevent the camshaft from snapping ahead as the nose on any particular cam passes its cam follower. As will be seen from the accompanying cut, the brake consists of a metal disk mounted in the housing of the worm gear in such a manner that it cannot rotate but is forced against a flange on the rim of the worm gear by a coiled spring in a mounting hub bolted to the worm gear housing from the outside. Adjustment is apparently provided for by means of washers under the flange of this hub.

Probably the most prominent make of small car employing an overhead camshaft is the Wolseley. The construction is similar in some respects to that on the Napier engine but is simplified. Besides, the drive of the camshaft is through spiral bevel gear instead of worm gear. However, this spiral bevel gear drive is preceded by a silent chain drive from the crankshaft to a parallel shaft directly above it at a ratio of 1 to 1 and with a very short chain. The 2 to 1 reduction is obtained by the lower pair of bevel gears, which permits of the use of a small pair of gears at the top, thus making for neatness. It would be practically impossible to obtain this reduction at the bottom of the vertical shaft and still have the driving pinion on the crankshaft, for the reason that in order to clear the crankshaft bearing the pinion must be of large diameter, and this would necessitate such a large diameter driven gear that the whole drive would become unduly bulky. As it is, the fan drive pulley is mounted on a forward extension of the horizontal shaft and the gear type oil pump forms part of the mounting of the vertical shaft. The shafts of this drive are mounted in plain bearings exclusively, except for a ball thrust bearing on the horizontal shaft.

This is a small bore four cylinder engine and the camshaft is supported in two bearings only. In order to reduce the unsupported length as much as possible, the two rearmost cams are arranged to overhang the rear bearing. The general arrangement of the valves, rocker levers and cams is practically the same as on the Napier. Both the camshaft and rocker lever shafts are supported by brackets on the cylinder head, and the rocker levers are located underneath the camshaft and give a greater lift to the valves than what might be called the cam throw. Clearance adjustment is made by means of set screws in the ends of the levers which are locked by clamping bolts in the split ends of the levers.

The spiral bevel gear drive seems to have much to recommend it for overhead camshaft engines, but it must be realized that in order that the gears may run together quietly and efficiently they must be accurately adjusted. As there are two pairs of gears, four adjustments are required, and, besides, provision must be made for any want of alignment or relative motion due to differences in heat expansion between the upper and lower bearings of the vertical shaft.

This problem has been attacked by two engineers of Bentley Motors, Ltd., an English concern, who have taken out several patents covering a number of design points. Referring to the sectional drawing herewith, the vertical shaft is made in two parts, which are joined together by means of a telescopic splined coupling. Each part can be accurately adjusted endwise with or in its casing. At the bottom this end is attained by providing the casing with a flange, which, instead of being bolted directly to the crankcase, is provided with a threaded ring. This ring can be screwed up or down over the integral flange and with it forms a flange of adjustable thickness. At the top a bearing box C can be rotated slightly by inserting a bar through the hole closed by plug D, and by being rotated is being adjusted up or down by means of the helical slots X and pin screws in the casing extending into them.

The camshaft is held against endwise motion by means of two thrust bearings at the forward end, and can be adjusted endwise by simultaneously turning the two nuts at opposite sides of these bearings. It will be noted that the upper part of the casing for the vertical shaft is integral with the camshaft casing while the lower part is integral with the crankcase and the intermediate part bolts to this lower part. In order to permit of complete alignment of the upper and intermediate parts of the case the bolt holes through the cylinder base lugs H are made oblong. The endwise freedom of the connecting rods on the piston pins permits of slight variations in the position of the cylinder block on the crankcase. It is thus possible to adjust the mesh of both sets of gears and also the alignment of the two parts of the vertical shaft housing.

(To be concluded)

THE Bureau of Standards, Washington, D. C., has issued Technologic Paper No. 206 on the Effect of Heat Treatment on the Mechanical Properties of 1 per cent Carbon Steel (spring steel). The paper gives the effects of varying time-temperature relations in heat treatment on tensile and impact properties, hardness, and structure of 1 per cent carbon steel, as follows: (a) Effect of temperature variations in hardening; (b) time of hardening temperatures above A_{cm} between the A_{c_1} and A_{cm} transformation; (c) effects of tempering steels hardened in different ways and effects of "soaking" just under the lower critical range, and (d) comparison of oil and water hardening for production of definite strengths. Under the described conditions of treatment and test, the features observed are described in detail under eight headings.

New Tractor Gearsets Have Novel Reverse Mechanism

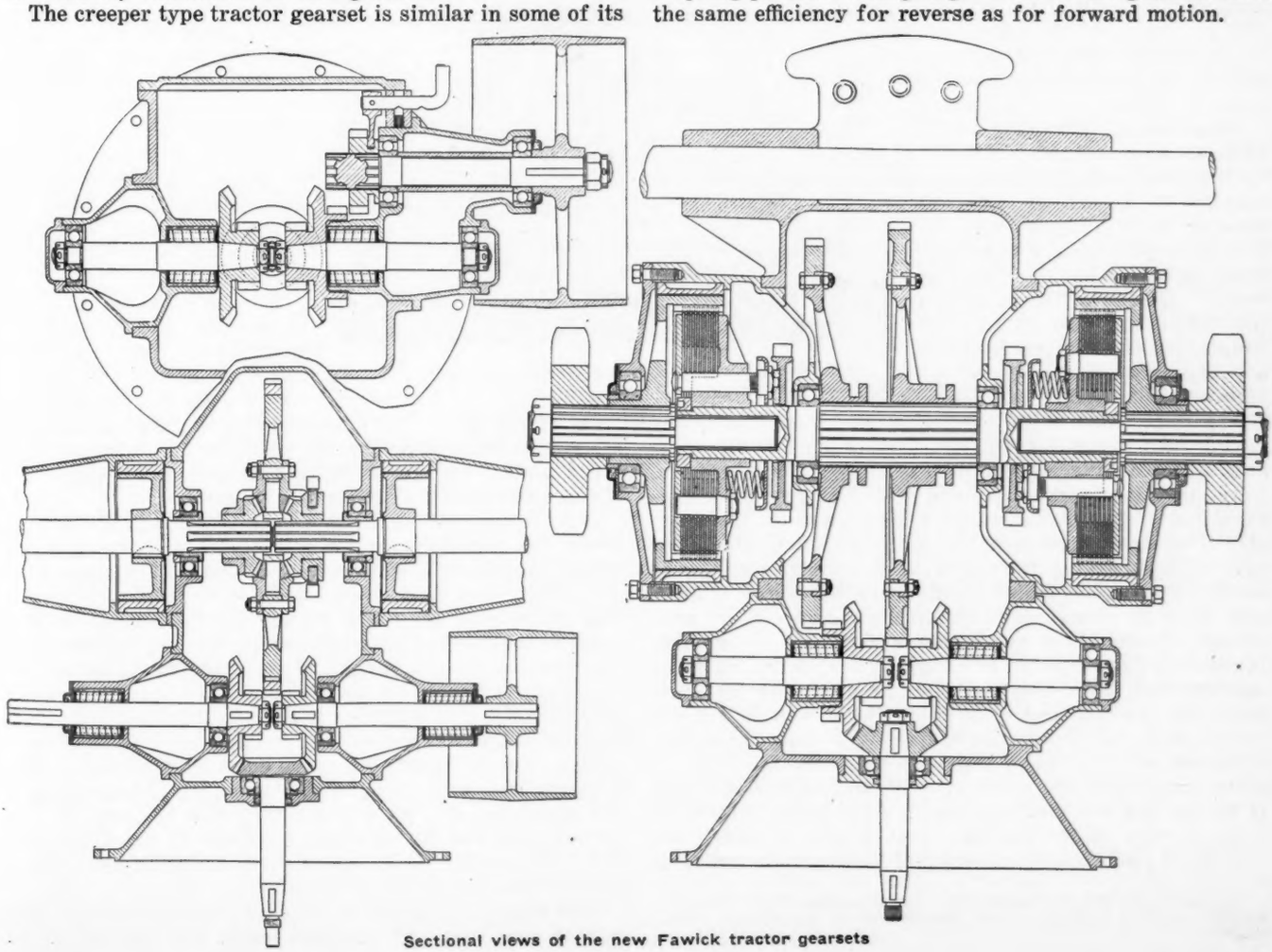
Reverse accomplished by sliding differential gear sideways. Designed for unit powerplant construction and both provided with a belt pulley.

TWO new gearsets—one of them for a cultivator gives only a single speed and reverse; the other a two-speed and reverse gearset for creeper type tractors—are illustrated herewith. The designs are the product of Thomas L. Fawick of the Twin Disc Clutch Co.

The cultivator gearset is intended to be used in connection with a final speed reduction at the drive wheels, in accordance with general practice in motor cultivator design. The novel feature of this gearset is that for reversing the direction of motion of the cultivator the differential gear is slid sideways on the splined differential shafts, whereby the gear ring on it is brought into mesh with one or the other of the two spur pinions which are formed integral with bevel gears on intermediate shafts. The design of the gear is quite simple and the gearset is claimed to be a good manufacturing proposition for this reason and also because most of the parts are duplicated, so that the number of different parts is small. Bronze bushings are entirely eliminated in this gearset.

The creeper type tractor gearset is similar in some of its features to the cultivator type, but it has two forward speeds and reverse and is fitted with Twin Disc clutches for steering, while the differential is dispensed with. One of the bevel gears on the intermediate shafts is provided with two spur pinions, one on each side, and two large sliding gears are mounted on a splined shaft carrying the steering clutches. The shafts for the chain wheels are supported in bushed pilot bearings in the ends of the splined shaft and in ball bearings mounted in the gearset housing.

This gearset is provided with a power take-off which can be thrown out of mesh when not in use. The pulley shaft is located directly above one of the bevel gear shafts, the one on the right side of the tractor, and its pinion, which is adapted to slide on the splined end of the shaft, can be engaged with the high-speed pinion on the back of the bevel gear. The gears are meshed and unmeshed by means of a pull rod extending through the wall of the housing and locked in the "in" and "out" positions by means of a spring-pressed locking dog. Both of the gearsets have the same efficiency for reverse as for forward motion.



Sectional views of the new Fawick tractor gearsets

Speeding Up Screw Thread Inspection by Optical Projection

Speed and accuracy obtained in this operation by the Hartness Screw Thread Comparator. Method applied to test cutters and to locate imperfect edges of gear teeth by tracing outline of a median tooth section.

By Ralph E. Flanders*

THE Screw Thread Comparator, originally devised to test screw threads, was the invention of Mr. Hartness, president of the company with which the writer is connected. It related particularly to a special means of supporting the screw between a source of light and a projection microscope, and a special chart with tolerances indicated on it to receive the projected image. The combination of these novel elements made it possible to inspect all the significant dimensions of a screw thread at a single glance, indicating the degree of error in major diameter, pitch diameter, root diameter, form, lead, quality of finish, etc., and, more important still, the total effect of all these errors on the fit of the screw in a standard hole for any desired length of engagement.

An arc lamp is ordinarily used as a source of light. Its brilliance permits the apparatus to be set in any suitable dimly lighted location, a completely dark room being desirable but not necessary. The small area of the light source also adds to the sharpness of the image—a prime requirement where accuracy is desired.

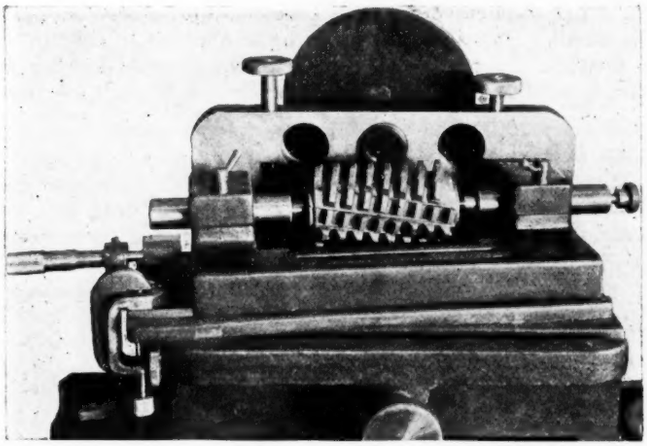


Fig. 1—Hob mounted for test on the Comparator

The microscope is of special construction, the lenses having been figured by Dr. Hastings of Yale, and ground and mounted by Brashear of Pittsburgh. The problem solved in this special microscope is that of getting a magnification of 200 diameters at a distance from the operator of about 5 ft., without chromatic diffusion (that is to say, without having the edges of the image show wide bands of color instead of clear, sharp black and white), and without measurable distortion. Now it is easy enough to meet these requirements if the screen or chart is permitted to be 40 or 50 ft. away, but in this case the magnification does the operator no good, for he must leave the machine and walk up to the screen to get the benefit of it. It is likewise easy enough to get the magnification at close range and with a sharp outline if we do not care about distortion; or with an undistorted image if we are not troubled about hazy color bands instead of a sharp edge to the shadow. But to get all three conditions of nearness, sharpness and accuracy of image is very difficult. We believe it has been attained in this microscope to a degree hitherto unknown. Our success in the matter has been due to putting the problem of lens calculation and manufacture into the most skilled hands we were able to discover.

Note that the machine is a *Comparator*, as its name indicates. The final standard is not the outline on the chart, but the plug gage whose shadow is set to coincide with the chart. This principle of using the apparatus as a *Comparator* will be followed in all the subsequent demonstration on the measurement of gear and cutter outlines in that they will ordinarily be referred to an outline on an actual standard instead of to a drawn outline on a chart. The advisability of this will be demonstrated later.

We now pass to the distinctive use of the machine in connection with gear and gear cutter inspection, of which the simplest is the inspection of gear cutter outlines.

For this work the machine has to be entirely rearranged. The cutter is mounted on a true arbor between dead centers in front of the lens. The microscope in this case must have a large aperture to take in the whole tooth. A stop is provided against which the cutting face registers to keep it in the vertical plane for which it is focused.

Now to get the required degree of magnification (say 90 or 100 diameters for the work) at a distance of 5 ft., where the operator can observe it and at the same time manipulate the work, would require an angle of projection so wide that no lens system can be devised to preserve both freedom from distortion and achromatism, or freedom from color bands. We are therefore led to the expedient of reflecting the image against a mirror placed at a distance and bringing it back to the operator's position, where it is received on the back of a ground glass screen. On the front of this the operator can work freely, drawing lines or erasing them, comparing the image with his drawings, etc., all without throwing his own shadow on the screen at the operating position of the apparatus. What is equally important, a considerable group of men can examine the image at close range.

The mirror, it should be noted, is not an ordinary one with a "silvered" or amalgam back, but has an actual

*The Jones & Lamson Machine Co. Paper presented at the Buffalo meeting of the American Gear Manufacturers Association. Condensed.

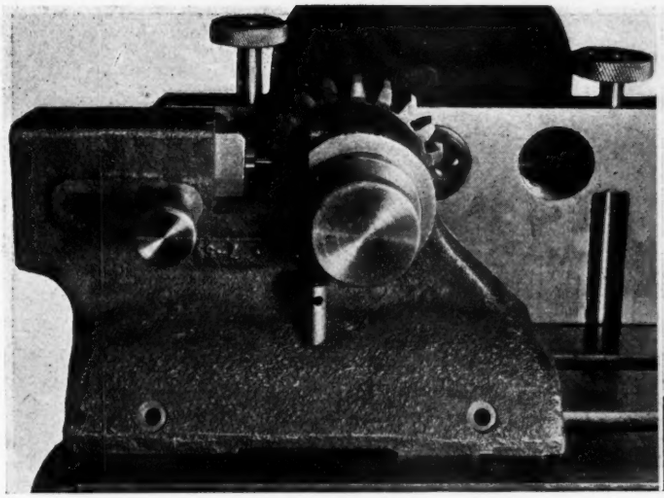


Fig. 2—Front view of fixture for projecting spur gear or Fellows cutters

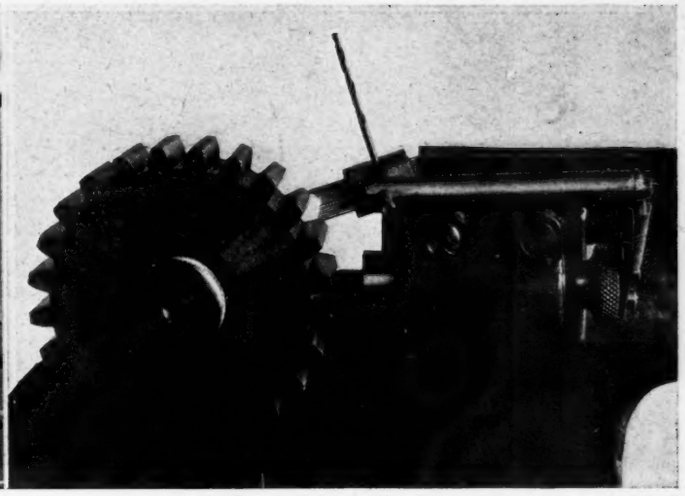


Fig. 3—Rear view of the same apparatus

deposit of silver on its front surface from which the reflection is made. This is the same method as is used in coating the parabolic mirror used in reflecting telescopes. This gives a more nearly total reflection of the light, and above all avoids the double reflection from both front and back faces of the ordinary mirror. The accuracy of the result can be judged from the fact that with a magnification of 100 diameters differences of 0.0001 in. can be detected.

Testing Regularity of Teeth

What use can be made of the machine set up as shown for projecting a form cutter? A most direct and valuable use lies in testing the regularity of the teeth, one with another. If the outline of the first tooth projected is carefully drawn on the screen, successive teeth may be indexed around into position and compared with the first one. By this means we may discover differences in outline, whether due to hardening distortion or inaccurate grinding; and also any run out of the teeth whether sidewise or radially. Furthermore, the teeth of a cutter giving satisfactory results may be compared with one which is not satisfactory and the reasons determined. By reversing the cutter on the arbor it can be determined whether or not the tooth outline is symmetrical. All the above determinations result from the use of the machine as a *Comparator.*

The use of this or any other projection apparatus for the direct comparison of tooth outlines with diagrams drawn to an enlarged scale is a more difficult matter—more of a laboratory job than an ordinary shop process. In the first place we would either have to replace the silvered plate glass mirror with one more nearly optically perfect (which might cost two or three hundred dollars) or place the screen at a great enough distance from the lantern to get the required magnification directly. The latter solution throws away the advantages of the mirror and ground glass screen just enumerated.

Some Precautions to Be Taken

Besides this, a very high degree of accuracy in the location of the work holder, microscope and screen with reference to each other would be necessary. All must be centered on the same optical axis at the proper distances, and the screen must be perpendicular to that axis. Then all must be firmly held to prevent accidental shifting by jar or otherwise. The most practical way of effecting this would be to place in the focal plane of the machine an object of known and easily measurable dimensions, provide on the screen an outline of it drawn to the scale desired, then focus and shift the screen until the image and outline match. Any other outline in this same focal plane will then be correctly magnified on the screen. But the screen must not be shifted, nor can the work be focused anew, nor the microscope be screwed in or out. To do any of these things would throw the image out of scale.

The work, however, can be shifted in the focal plane to match the diagram, or the microscope can be adjusted in a plane perpendicular to the optical axis to obtain the same result.

In Fig. 1 is shown a hob mounted to be tested on the *Comparator.* Here the additional element of lead variation has to be considered, and this is taken care of by mounting the hob, its arbors and the centers on which it is mounted in a frame which rolls on ball bearings in tracks, machined in the base of the device. The advance of each tooth is measured by matching it with the outline on the chart, and reading the axial distance moved from the micrometer, or by means of Johansson blocks, or both.

Excellence of Microscope Objective

The center line of the hob must be set at the proper angle to bring the face of the tooth to be inspected as nearly as possible in the focal plane. This angle is presumably the helix angle of the hob measured at or near the pitch diameter. A stop is preferably used to locate the cutting edge in the focal plane. In expert hands the stop can be omitted, as bringing the outline to a sharp focus indicates that it is within less than .001 inch of the required position. A movement of this amount either way will blur the outline. This, incidentally, shows the excellence of the microscope objective.

In Figs. 2 and 3 are shown front and rear views respectively of a fixture for projecting spur gears or cutters of the Fellows Gear Shaper variety. It is shown with a cutter mounted in place in Fig. 3. It consists simply of a frame carrying a stud on which the gear or cutter is mounted, and an index pin or spring plunger carried in a holder adjustable for diameter, having a conical point to engage and locate the tooth space. The stud on which the gear or cutter is mounted is cut away to give two fixed contacts on the side toward the index pin, and one with spring pressure behind it on the opposite side. In the case of gears with holes varying in diameter, this insures a nearly uniform presentation of the teeth to the microscope.

Going back now to Fig. 3 and the testing of the gear shaper cutter, the following important points should be noted: The tops of the teeth are not ground square but at an angle of 5 deg., so that it is necessary to set the at-

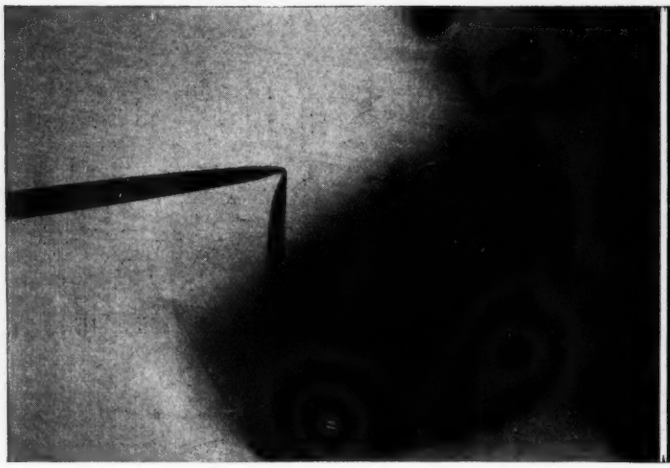


Fig. 4—Showing use of needle in exploring the outline of an intermediate section of the gear

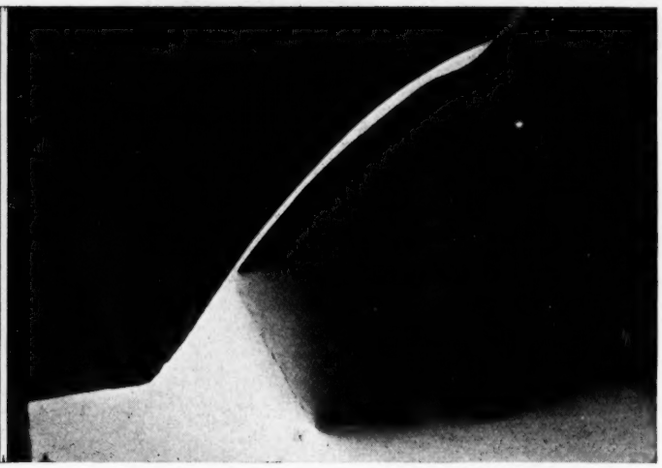


Fig. 5—Showing effect of a roughly formed templet applied to the surface to be outlined

tachment at that angle on the work table of the machine to bring the cutting edge uniformly into the focal plane. Secondly, in comparing one cutter with another, owing to the nature of the relief on the cutter, the image must be brought to a focus, not by shifting the cutter along the optical axis by the regular focusing screw, but by shifting the cutter along its own axis which is at an angle of 5 deg. with it. Otherwise the comparison will be worthless.

Two kinds of test may be made with the gear shaper cutter. The first is for indexing. In this test an outline of one of the teeth is drawn on the screen, and then successive teeth are indexed past this outline and the amount of variation in position is noted.

Comparison of Teeth Outline

The other and perhaps more interesting test is for comparison of the outlines of the different teeth on the same cutter, or with those of another cutter, or with a standard made for the purpose. In this case the accurate index pin previously used is replaced by one having a point slightly eccentric. By turning this pin the cutter may be very delicately rotated to bring the image of each tooth to an accurate match with the drawn diagram, irrespective of any slight errors in indexing. Besides the precautions mentioned above, other points inherent in the involute system must be observed. The thinner tooth of the ground down cutter as compared with the new one is an essential for theoretical accuracy, and not a mistake. Within certain limits changes in shape at the fillets, or anywhere below the base circle of the cutter, do not affect the acting surfaces of the cutter or of the gear cut. In the event of an attempt to compare cutter outlines with drawn diagrams, due regard must be had in this case as in all others to the precautions mentioned early in the paper. In this case also the most satisfactory use of the machine is as a *Comparator*, to compare outlines with each other or with a standard, rather than with an unregistered diagram.

So far we have been talking about projecting cutter outlines, a problem which is comparatively simple, owing to the sharp, definite character of the cutting edges. When we come to gears themselves, however, the problem is a serious one. The edge is rubbed over on the entering side of the cut and provided with burrs on the other side, which cannot be removed with any assurance that the true outline will be retained. Worse than this, many gears, especially in automobile work, have the teeth chamfered at one or both edges, thus making a reliable outline impossible. Until recently, the best method available was to clamp a thin sheet of metal between two thicker blanks of the same material and cut teeth in all at the same time. This produced a thin templet, practically free from burrs, and of correct outline, and thus suitable for projection. This was all right theoretically, but such a gear could not be tested in actual running, nor could it be compared with one which had been run. The problem was thus practically unsolved. What was needed was some method of project-

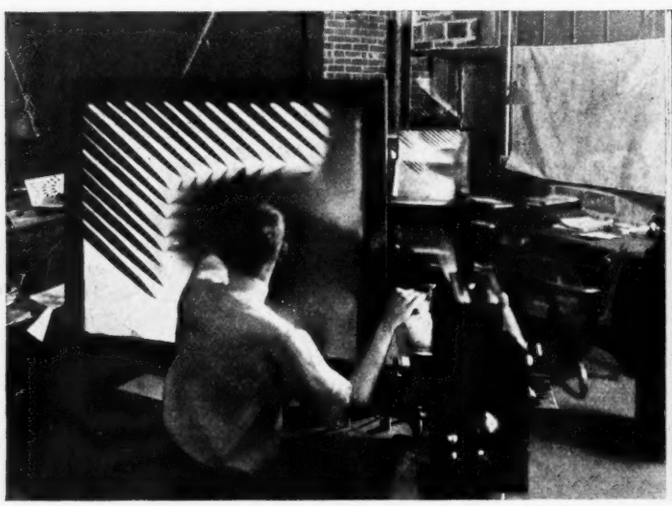


Fig. 6—The whole apparatus at work with gear mounted in fixture shown in Fig. 3

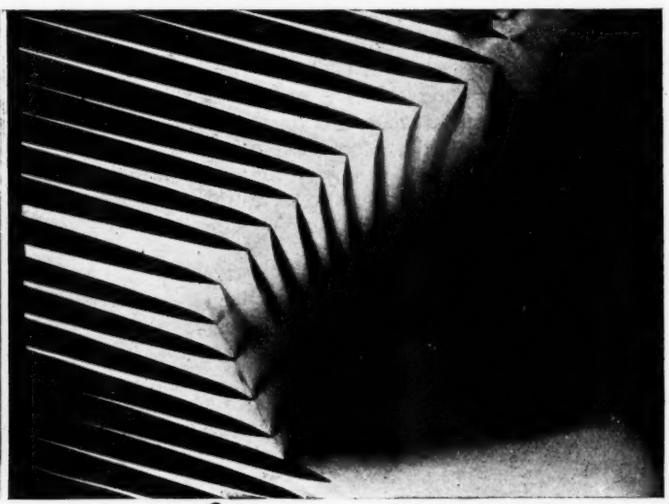


Fig. 7—The image of the gear teeth projected on the screen

ing and tracing the tooth outline on any section from one end to the other. This difficult problem was solved in a very simple and beautiful way by Messrs. Beardsley and Porter of our organization.

If a gear with ground, lapped, or otherwise polished tooth surfaces is placed in the device shown in Fig. 3, and the device clamped on the work table so that it makes a slight angle with the optical axis (say 1 deg.) in a direction which tends to display the tooth surfaces to the microscope, we notice an interesting thing. The diagram on the screen tends to show an outline on the focal plane, whether that be located close to one end of the tooth or somewhere midway. This is due to the fact that the microscope tends to define anything in the focal plane and confuse everything else. Owing to the *"thinness"* of the focal plane of these special microscopes, the infinitesimal details thus picked out tend toward a sharp outline, but yet not sharp enough for practical purposes. How shall this outline be developed?

It was done in a most simple manner. As shown in Fig. 4, a needle was mounted and focused in the plane it was desired to explore, and then the tooth outline was traced by its point. The junction of the point and its reflection, as shown, furnished a location for the surface measurably accurate within .0001 in.; and it made possible the rapid drawing of the outline with nearly this degree of accuracy. With the outline once drawn, other teeth of the same gear, or of other gears, can be likewise indicated with the moving needle point, and satisfactorily compared with the drawn outline.

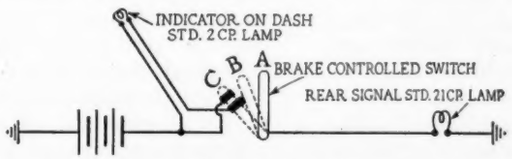
For extreme accuracy the reflected image of the needle is required, but this does not confine the use of the process to highly polished surfaces. Even roughly cut, hardened gears, with the black of the furnace on them, show some reflection under the glare of the arc. It is our conclusion that, in general, any ordinary gear will show reflection enough to allow measurement in reasonable proportion to the accuracy of the surface measured.

Variations of this method were developed later. For instance, Fig. 5 shows the effect of a roughly formed templet applied to the surface to be outlined. That surface is not indicated, as might be supposed, by the adjacent tooth outline shown. That is merely the reflection of the templet. The real tooth-shape lies midway between the two outlines and would have to be so drawn. With a somewhat more accurately made templet this method might well be used in practice.

What promises, however, to be the most practical application of this principle is embodied in the device shown mounted above the index pin in Fig. 3. Here we have a whole battery of needles laid side by side in the shallow groove of a suitable holder and held in place by a sheet rubber pad between them and a rotatable spindle (shown in the illustration as a small twist drill.) When a gear is mounted in the fixture as shown and the spindle is revolved between the fingers, the needles approach the tooth outline, stopping in contact with it for its entire length from top to root. Fig. 6 shows the whole apparatus at work, with the inspector in the operating position, and Fig. 7 shows the image on the screen.

An Improvement for Rear Signal Lights

AUTOMATIC rear signals for automobiles have rapidly increased in use during the past year, especially in the cities, and some of their defects are beginning to attract attention. When a car is equipped with such a signal

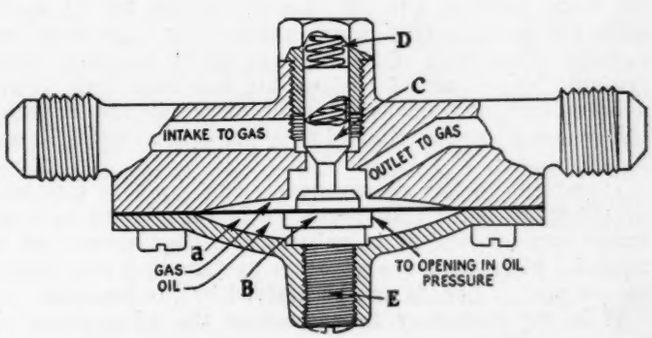


Details of dash indicator lamp for rear signal light

the driver naturally relies upon it, but if it is in the form of a signal light mounted on the rear of the car there is nothing to show him whether it really operates. Some of the signals which have been put out are said to be rather cheaply made and not to warrant this reliance. The National Lamp Works have now brought out a small dash indicator lamp to be wired in such a manner that it is momentarily connected in circuit with the signal lamp when the circuit of that lamp is closed by the operation of the brake or clutch pedal. The arrangement is shown by the diagram herewith. A device has also been worked out to be used in cases where it is desired to give warning to drivers in the rear that the car is to be turned to the right or left. This necessitates three signal lamps and two switches, one of them a two-point switch, but only a single dash indicator lamp. The indicator lamps remain in circuit only for a moment and not for the entire period that the signal lamp is alight.

Safety Fuel Valve

AN automatic valve designed to protect the engine in case the oil circulation fails or becomes inadequate for any reason has been placed on the market by the Xplo Corp. of Indiana under the name of the Xplo automatic gas control valve. It consists of a diaphragm valve inserted in the gasoline line. Evidently a valve of this kind is applicable only to engines having a pressure lubricating system. A lead from the pressure system is connected to the diaphragm chamber. A conical valve is secured to the center of the diaphragm and is held in the closed position by a coiled spring within its hollow shank. When the pressure of the oil against the diaphragm exceeds the pressure of the coiled spring the valve will be opened and the gasoline can flow from the vacuum feed chamber to the carburetor. Should the oil pressure drop below ½ lb. p. sq. in. the fuel valve will shut automatically and prevent the delivery of more fuel to the carburetor, thus protecting the engine bearings against burning out.



Sectional view Xplo automatic gas control valve

Automotive Transportation for the Farmer Has Hardly Begun

Highway transportation system program of the American Association of State Highway Officials calls for 186,700 miles of improved highways. 69,100 miles under construction or finished. Program will be completed in 15 years and will open up a vast rural market for motor truck sales.

By William C. Markham*

THE use of automotive transportation by the farmer has hardly begun despite the fact that there were 1,346,000 trucks in use over our highways in 1921. When we realize, however, that already 12,000 trucks are used in the country to take farmers' children to school, that hundreds of motor express lines with regular schedules have been established, that 6,000,000 head of cattle were transported by truck in 1921, it is sufficient to indicate the possibilities of automotive highway transportation.

Some idea of the scope of the program of the American Association of State Highway Officials for a highway transportation system, which is, we believe, the foundation for almost unlimited possibilities of the utilization of trucks for farmers, may be secured from a paragraph description of the work to be done. Actual work has been under way now for two years and the program is not merely one on paper.

The highway transportation system throughout the United States is 186,700 miles, of which 69,100 miles have already been improved or are in various stages of construction. This program of 186,700 miles constitutes only approximately 7 per cent of the road mileage of the states but is a representative 7 per cent of roads in each state. In other words, the first 7 per cent of good roads improved in each state are those roads which best serve the rural districts and afford a connecting link in each state for a national highway automotive transportation system. That part of the mileage which has been constructed by the use of Federal aid has been done at an average cost of $18,000 per mile, of which the Federal Government has contributed 42½ per cent and the States 57½ per cent.

Investigation has shown clearly that up to a distance of 150 miles truck transportation is superior to railway transportation and it is only by the development of a national highway transportation system that the greatest amount of benefit can be derived by the farmers.

It is not necessary to enumerate the advantages of automotive transportation in short line hauls, but an investigation among the 1,500,000 members of the American Farm Bureau Federation, which is co-operating with the Association of State Highway Officials, shows that within the past three years farmers in some States have about giving up their own trucking.

The establishment of an adequate automotive highway transportation system has made this possible and the advantages are many, principally the saving in time of the farmer, and the saving of the uneconomical loss sustained by a farmer when he gets in his truck and goes to town for some sort of repairs or takes a load of produce in to the city, returning home empty.

MR. MARKHAM predicts that the next five years will bring about such strides in highway transportation that the average farmer will get his mail twice a day instead of once and that he will be served by highway transportation fleets making daily deliveries and offering 24-hour service to him in the shipment of produce to the city.

The writer also believes that with the completion of the program, already under way, giving the farmers of the United States an adequate highway transportation system over which they can have a regular automotive transportation service, the possibilities of sales by truck manufacturers in the transportation field will be almost beyond limitation.

So firmly has Congress been "sold" on the idea of Federal aid in developing highway transportation that I feel that it is a safe prediction to state that the question of Federal aid in the future, as a policy, is as thoroughly intrenched as rural mail delivery.

As a prediction for the future the writer is also willing to hazard a prediction that the next five years will bring about such strides in highway transportation that the average farmer will get his mail twice a day instead of once. He will also be served by highway transportation fleets making daily deliveries and offering 24-hr. service to him in the shipment of produce to the city.

There is no better way to approach a study of the necessity for proper highway construction and upkeep of roads than an investigation of the cost of highways in relation to the cost of the methods used for transportation over them. Comparing the funds used for the construction of roads and the public's money tied up in highway rolling stock of a motorized character, we find some very interesting comparisons.

Placing a value of $1,500 on each truck and $750 on each passenger car, we find that in 1910 the value of the motor vehicle investment was $386,250,000. That year we spent for new road construction $95,000,000. The States expended for new construction from 1910 to 1916, inclusive, $1,056,000,000, but the motor vehicle investment had jumped to $2,822,250,000. The entire funds for

*Representative of the American Association of State Highway Officials and affiliated with the American Farm Bureau Federation.

road construction from 1910 to 1921, inclusive, was $2,526,000,000, while motor vehicle investments in 1921 had reached the peak of $8,322,000,000. Some idea of the strides that are being made in highway transportation systems may be gained from the fact that last year a total of $600,000,000 was spent by the Federal Government, States and counties on its highway system.

For the future the outlook for a continuous and steady growth of our program is exceedingly bright. The Dunn bill appropriating $65,000,000 for the fiscal year ending June 30, 1923, and $75,000,000 for the following year, which is receiving the active support of our association, passed the House on May 1 and is now up for conference with the Senate, with the practical assurance that the appropriation will be passed to carry on the Federal aid program adopted under the National Highway Act.

To date something like $350,000,000 has been appropriated by the Federal Government during the past five years in the national highway transportation system. A careful survey of the probable time necessary to complete the first step in the building of good highways throughout the country, which includes but 7 per cent of the total mileage shows that the first 7 per cent of good roads aggregating 186,700 miles, can be completed in 15 years if the Federal appropriations aggregate as much as $75,000,000 per year. On an appropriation of $100,000,000 per year, which is the sum recommended by the association, the first link of national highways could be completed in ten years.

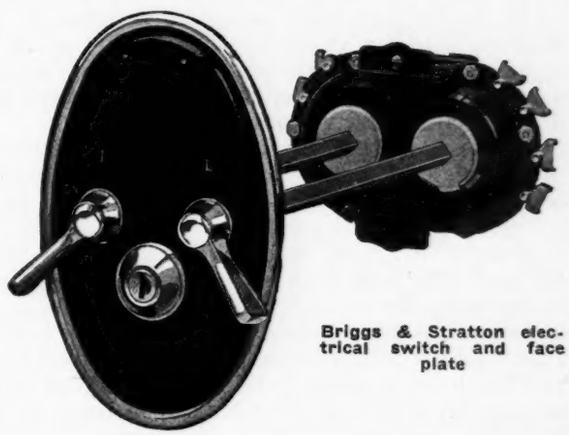
With the completion of this program, already well under way, giving to the farmers of America an adequate highway transportation system, over which they can have regular automotive transportation service, I feel perfectly confident in making the assertion that at the present time the use of automotive transportation by the farmer has hardly begun and the possibilities of sales by truck manufacturers in the transportation field are almost beyond limitation.

New Automotive Lighting and Ignition Switch

A NEW lighting and ignition switch which has the operating levers placed at the end of long, rigid rods by means of which the actual switch mechanism is operated, has been brought out by the Briggs & Stratton Co. The extended handles make it possible to mount the face plate of the switch and the levers on the dash, while the actual switch mechanism is placed under the hood, usually on the bulkhead, where the switch terminals are easily accessible. This construction frees the space immediately behind the dashboard of the usual conglomeration of wiring.

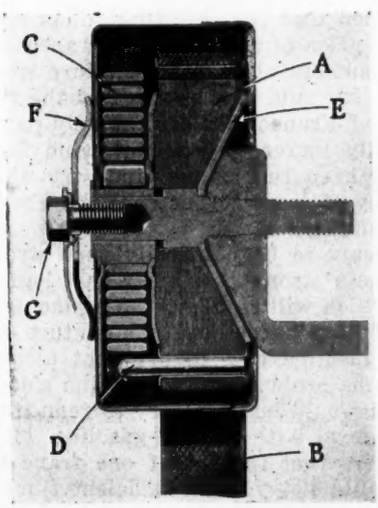
The advantages of the new switch are self-evident. With all the switch connections under the hood, trouble in the ignition or lighting system can be more readily located, fuses more quickly replaced and other changes made. The complete chassis can be wired before the body is fitted, and thus a material saving effected in both the time of assembly and the amount of wire required.

The operating parts of the Basco extended handle switch (as the device is called) are of the same general design as those of other switches manufactured by the Briggs & Stratton Co. The dash plate can be furnished in any shape to conform to the general arrangement and style of other instruments to go on the dash.



Briggs & Stratton electrical switch and face plate

Star Rebound Controller



The Star rebound controller

A SPRING rebound check of the type comprising two co-acting friction members, one stationary and the other rotatable, is being made under the name of the Star rebound controller, by the Kulas-Snyder Mfg. Co. It comprises four working parts, viz., the rotating drum A, the belt B, the spring C, and the swivel hook D. The resistance to rebound is produced by the friction between the self-lubricating wood drum A and the conical stationary friction plate E. This resistance may be adjusted by means of the star spring F and cap screw G. There is a combined indicator and lock on the cap screw which turns with it and engages into any of five locking depressions on the star spring. The object of the coiled spring is to keep the belt taut when the chassis spring compresses. The inner end of the coiled spring is secured to the spring collar which is mounted on the center bolt so that it can slide but not rotate on same. The large area of the friction surface and the means provided for taking up play due to wear should assure long life of the device.

France May Make Use of Alcohol Mixture Compulsory

Use of alcohol mixture as a so-called national fuel would reduce gasoline imports and stabilize the wine and sugar beet industry by utilizing the surplus product converted into alcohol. Plan tax on all wine and cider marketed to enable the alcohol mixture to be sold as cheaply as gasoline.

THE use of a State-produced gasoline substitute may become compulsory in France. Various interests in France have been attempting to find an assured market for the alcohol distilled from sugar beets, surplus wines and other vegetable products. The quantities of such alcohol produced in any year fluctuate according to whether the respective crops are excessive or deficient; and these fluctuations have been very detrimental from the standpoint of the growers. The growers would like to be assured against over-production by an arrangement which would always enable them to convert their surplus into alcohol at remunerative prices.

During the war the necessity of alcohol production for use in the manufacture of munitions came into prominence; and accordingly the persons interested in the manufacture of alcohol can claim that as a matter of national defense France must have an assured supply at all times. The wine growers have procured legislation which prevents the sale of beet alcohol for use in the production of potable beverages, thus reserving for their wine alcohols the most remunerative French markets.

The French Government itself has been forced to purchase alcohol and relieve the strain upon the producers and is now said to hold nearly 1,000,000 hectoliters. The production of alcohol during the months of October and November, 1921, is shown by the following table:

(Hectoliter = 26.4 U. S. Gallons)

	Hectoliters
Wine	33,246
Ciders and Perry	50,832
Fruit and grape pulp	68,892
Grain	31,482
Sugar beets	242,289
Molasses	12,515
Other substances	338
Total	439,594

A French official commission was appointed in February, 1922, by the Ministry of Finance to fix the price of alcohol derived from the current beet crop.

The solution which has been hit upon for disposing of the excess stocks of alcohol and providing a regular market for it in the future is the enforced use of alcohol as an adulterant of gasoline. There have been earnest efforts and continual propaganda, in favor of a so-called "carburant national," i.e. a mixture of gasoline and alcohol which would reduce the dependency of France upon the United States, England and Holland for mineral oils, and would furnish a profitable outlet for locally produced alcohol.

During the early days of April, 1922, a national congress was held at Beziers (Department of Herault) in this consular district, attended by authorized representatives of the beet alcohol interests and the wine alcohol interests. Elaborate automobile and cyclecar tests were held at great expense, in order to prove the practical value of the formula which has been developed for the carburant national. This formula, which represents the results of protracted research by several French scientists, is now associated with the name of M. Godchot, the Dean of the Faculty of Science of the University of Montpellier, Montpellier being situated in the heart of the wine region. It is as follows:

Gasoline	900
Alcohol at 95 deg	100
Cyclohexanol	17.5
Phenol	37.5

As a result of the Beziers conference it is claimed that the utility of this formula is completely vindicated, and the conference also resulted in the adoption of an agreement, or concordat, between all the interests involved, for national legislation to compel the substitution of the new mixture throughout France in the place of gasoline for all purposes.

The difficulties have hitherto been that the price of the alcohol has been somewhat higher than the price of gasoline so that the resulting mixture would be somewhat more expensive than gasoline. Under the terms of the Beziers concordat, the French Government would establish a national alcohol office possessing a monopoly of the purchase and sale of alcohol, and this office would produce the carburant national. It would be subsidized by a tax of one franc per hectoliter on all wine marketed in France and of 50 centimes per hectoliter on all cider marketed. It is claimed that the resulting funds could be used to reduce the price of alcohol to such an extent that the ultimate consumers of the new mixture would not suffer financially. It would thus appear that the wine and cider consumers of France would ultimately pay in the share of a slightly increased price of wine for a subsidy which would keep the alcohol industry afloat and would diminish by at least 10 per cent the French importations of gasoline.

The movement appears to be politically very strong, and there is said to be a strong possibility that legislation will be enacted which will result in the replacing of gasoline throughout France henceforth by a mixture containing 90 per cent gasoline and 10 per cent alcohol. The weakest point in the project seems to be the amount of the wine tax which would be necessary to reduce the price of alcohol to a level with that of gasoline. It is feared in some quarters that the tax of one franc per hectoliter on wine would not yield a sufficient fund to provide the necessary subsidy.

American Manufacturers Must Co-operate With Latin Distributors

South America offers ready market for the one-ton truck and short wheelbase taxicab. Good roads campaign opening up a large automotive market. Inadequate transport systems must be aided by motor bus lines.

NOT so many years ago there existed in the United States of North America the same road conditions one finds throughout all the Latin countries to-day; the same sparsely settled areas, pioneering conditions and drive on the part of the Nation for good roads.

The greatest help to the betterment of roads proved to be the automobile. It has helped because owners have demanded better roads over which to operate their cars. Likewise in the Latin countries, the motor truck as well as motor car has helped because it was used to haul passengers from the railroad to their new inland homes. The settlers built new roads so that light motor trucks could carry them and at the same time bring the products of the soil back to the railroads for transportation to the city.

Two events will take place in South America during the season of 1922 that will duplicate the events that have helped to open up many sections of the United States. The first is the Good Roads Convention in Argentina in May and the other the Brazilian Centennial Exposition opening next September. These two events will do more to open the eyes of the automotive trade of the Latin world to the value of the so-called speed-wagon or one-ton truck and the taxicab than anything else.

The one-ton truck is a vehicle especially adapted, at present, to the needs of all Latin countries. Leaving aside its great value in the large cities as a delivery wagon, its use as a means of transportation in sections of the countries that are being opened up, leading inland from the main arteries, such as railroads or highways, is of far greater value than the motor car. Such trucks can be equipped to carry not less than twenty passengers, and while the roads at present may be bad, the sturdy construction of these one-ton vehicles will enable those who purchase them to operate them at a profit. Wherever speed should not be over twenty or twenty-five miles an hour, where the country is rough, as all new country is, these vehicles will be of great benefit.

Good Roads Campaign

In Brazil and Argentina, on the east coast of South America; in Chile, Peru and Ecuador, on the west coast; in Venezuela and Colombia on the north, there is a great campaign for road building. These one-ton trucks, besides hauling passengers and being used as buses, can be used in hauling road building material, where the heavier trucks are unable to travel, due to poor traction and lack of road bed sufficiently strong to support them. Near the large cities they can be used in hauling the product of the market garden to the city. On the farm, the coffee and the sugar plantations; in Patagonia, on the great sheep ranches, one-ton trucks at this time will prove their worth.

Late in 1922, in Rio de Janeiro, there will be great need of such vehicles as the one-ton truck and the taxicab. Vast numbers of people will visit there during the progress of the exposition and transportation will be required to the exposition grounds. At present there are practically no buses. There are many old time motor cars used as taxis and a few more up-to-date chassis of American-made cars now used as taxicabs. The one-ton truck of say 106 to 116 inch wheelbase with a bus body will be of great value at the time of the exposition and likewise the taxicab of not over 110 inch wheelbase. The short wheelbase is necessary because of the narrow streets in the city.

These ideas and plans cannot be developed in a day and the sooner the North American manufacturer and the Latin distributor get together on the problem, the quicker each will profit by the business in sight.

Bus Lines

The day is not far distant when a regular bus line will travel from Buenos Aires to Rosario; thence to Mendoza; and from there across the Andes to Los Andes and along the beautiful river into Santiago. At first it would be a sightseeing tour, and later assist in developing that wonderful country that now remains unopened. Not only the route from Buenos Aires to Los Andes and Santiago will be opened to motor travel, but there is no reason why trips cannot be made by buses between Mendoza and Tucuman, and the famous summer resort of Cordoba at the foothills of the Argentine Andes.

Going north to Rio de Janeiro someone will step in and start a line of buses running from Rio de Janeiro to the beautiful mountain and Brazilian summer resort of Petropolis. The road is beautiful and well made. Buses operated along this road on Saturday and Sunday would be patronized by those who cannot afford to pay for private cars. The writer believes no less than 3000 to 5000 of the population of Rio de Janeiro would be carried every Sunday. Then, too, there are other drives in and around the city that the poorer classes would favor, such as along the Flamingo, out toward the Botanical Gardens to Leme and along the bay. Some active American manufacturer and a much more active dealer is undoubtedly going to start these bus lines sooner or later, for the tram system of Rio de Janeiro to-day is unable to provide the necessary transportation. There are two lines of buses traveling along the Avenida Rio Branco in the city that do a thriving business, and that are always crowded, but these buses do not carry a fraction of what could be carried with the one-ton truck of the speed wagon type.

There are numerous instances all over South America where the short wheelbase taxicab can fit in very profitably. There are so-called taxis working and attempting to operate in Buenos Aires that should be ruled off the streets sooner or later because they are dangerous to life and limb. During the months of July and August there is great need in Buenos Aires for a closed taxi due to the dampness and rain. Long wheelbase motor cars are also at a disadvantage in many narrow streets.

The author thinks these facts would be advantageous for the Latin dealer and the American manufacturer to consider during the season of 1922.

Switzerland Demands Cheap and Light Motor Vehicles

Domestic Swiss car makers in bad slump because they have concentrated on luxury type vehicles. Export business at a standstill. Truck manufacturers protected by tariff and import restrictions. Few American cars imported during 1921, but American motorcycles took second place.

AN analysis of the statistics recently published by the Swiss Federal Government show that the automobile industry of that country has passed through a period of hard times and has fallen off materially. One of the reasons for this is undoubtedly the fact that the industry specialized on luxury types and as a consequence of the economic crises the home market is practically closed. The concerns which manufacture trucks and bus chassis, while feeling the depression, have not suffered as much as the car manufacturers. The increase in railway freight rates has caused a reaction in favor of the trucking companies with a resultant demand for trucks. The Federal Post Office is also placing a large number of orders in preparation for the extension of its passenger service in the Alpine region and other outlying districts. On the whole the truck industry is fairly well protected against foreign competition by the customs tariff and import restrictions.

The export trade is at a standstill owing to the depreciated currencies in neighboring countries, and the general raising of customs tariffs. It can easily be seen how serious this stagnation in the exporting of automotive products is, when one realizes that before the war exports absorbed as much as two-thirds of the total production of the country.

An examination of export figures shows that Switzerland exported 842 motor vehicles in 1913, 501 in 1920, while in 9 months of 1921 there were only 142 exported. Of the 1921 exports Spain took 58 vehicles, Dutch East Indies 20, France 19, Great Britain 17, and Belgium 13. In view of this great decline in exports it was hoped by the Swiss automobile industry that they could regain a foothold in the South American markets but it appears that they cannot compete with the American and English manufacturers.

Imports

Statistics show that imports have been steadily increasing. In 1913 there were 986 motor vehicles imported, in 1920 there were 5,841 and in nine months of 1921 the number dropped to 3,107. The majority of cars imported are of the small, light type, for which there is a very good demand. The countries from which the principal imports are made, the number of cars and the total values for the year 1921 follow:

Country	Number	Value (in Swiss francs)
France	1,070	11,685,000
Italy	732	8,330,000
Germany	627	6,841,000
United States	433	5,159,000

Automobiles were also imported from Austria, Great Britain and Belgium but in much smaller quantities, for example, a total of only 27 cars came from Great Britain.

It is worth while to look into these figures carefully and understand why the countries contribute in the order that they do. The fact that France takes first place in number of imports into Switzerland while Germany takes third place in spite of the extremely low rate of exchange in that country, is due to the fact that the German manufacturers demand very high extra charges which nullify the advantage of the low rate of exchange. The French on the other hand sell their automotive products at exactly the same rate to the foreign buyer as to the domestic buyer.

American cars are losing ground in the Swiss market which is due, according to experts, to the fact that our manufacturers do not supply a certain refined type of four seater so much in demand in Switzerland and other European countries. This type of car is being built pretty generally in Italy and France. It may be added that our rate of exchange is not as favorable as many other countries.

Motorcycles

Approximately the same economic conditions apply to the motorcycle market as apply to the automobile although the status of the industry is not the same. The Swiss manufacturers have turned their attention to the production of motorcycles with favorable results to the domestic producers. The export of motorcycles increased 15 per cent in 1921 over 1920. The principal markets in the order of their importance are Italy, France and the Dutch East Indies. Imports fell off one-third in 1921. The countries from which imports are made are listed below in order of importance with the total import values for 1921:

Country	Value (in Swiss francs)
Great Britain	750,000 (approximate)
United States	507,000
Germany	381,000
France	326,000
Italy	237,000

A comparison of the above table with that of automobile imports shows that the role of the countries is practically reversed, the United States playing a large part when it comes to motorcycle imports.

To show the increase and decrease in the exports and imports of the Swiss automotive industry as a whole, which includes motorcycles as well as automobiles, a table covering the ten years from 1912 to 1921 is given.

The table indicates a general increase in imports and a steady decline in exports. These two trends are modified during the war years 1915 to 1918 inclusive, in fact the movement was strongly reversed for those years, imports fell off greatly and exports mounted. It may also be

noticed that both exports and imports fell off in 1921, which may be taken as indicating a period of stagnation in the use and manufacture of automotive products. An explanation has been given for stagnation but it would be well to add here that the use of automobiles has been affected by a heavy increase in taxes in many of the Cantons.

	Imports (in Swiss francs)	Exports
1912	7,987,000	14,306,000
1913	9,195,000	13,951,000
1914	7,445,000	14,669,000
1915	2,241,000	28,745,000
1916	1,458,000	25,323,000
1917	3,824,000	24,425,000
1918	1,395,000	28,110,000
1919	31,246,000	22,088,000
1920	75,574,000	18,113,000
1921	38,587,000	5,208,000

The replacement of automobiles for diligences for carrying people over the passes is shown below to have resulted in a materially increased traffic. It is claimed that the traffic would have been much greater had it not been a bad tourist season.

	August, 1921 Motorcar No. of Passengers	August, 1913 Diligence No. of Passengers
Grimsel Pass	3,398	2,129
Furka Pass	3,719	1,383
Oberalp Pass	2,607	1,300
Simplon Pass	889	439
Spluegen-Misox Pass	3,198	2,081

It is an interesting fact that no serious accidents have occurred over the steep passes, and it reflects to the credit of the Swiss concerns who have made a special study of construction for mountain work. Owing to the very favorable results of last year's business, it has been decided to put 20 additional cars into the Alpine service this year and 16 motor buses are being ordered for other districts as well.

Postal Motor Service

There has been instituted recently an automobile postal service for carrying passengers which has proved very successful. Passengers to the number 751,633 have made use of the service as against 154,720 carried by the horse drawn vehicles. In fact success has been such that it is now planned to extend the new service to the Klausen and Gothard districts.

The following figures give an idea of the cost of the new motor service as compared with the horse post:

	Horse Post (in francs)	Motor Post (in francs)
Expenses	1,225,990	2,233,626
Receipts (parcel receipts not included)	337,380	1,785,733
Excess of expense over receipts	888,610	447,893

Three-wheel, electrically driven cars carrying 300 pounds are extensively used by the Post Office for parcel delivery in the cities. These have worked out so successfully that more have been ordered. The new ones will be of an improved type and constructed to carry 500 lb. The cost of both gasoline and electrically driven cars in the postal service has proven most economical and the estimate for 1921 which was 2,610,000 francs has been reduced to 2,150,000 francs for 1922, of which 800,000 francs is for gasoline and electricity.

Uganda Opening Up as an Automotive Market

IN 1920 a loan of £1,000,000 was raised to develop the transport facilities of Uganda. Committees were formed to consider programs of road construction and waterways development, while the financial resources for this work were augmented by the cotton tax, specifically raised to improve communications in the cotton-growing districts.

During the last nine months of 1920 some 55 miles of new motor roads were constructed, says a British Colonial Report.

There are now 650 miles of excellent roads fit for motor traffic in all weathers and about 800 miles of roads suitable for light motors in the dry season. This mileage would have been even greater but for an insufficient supply of labor.

Last year the Government Transport Department had 16 motor trucks in use. The department has been handicapped by the considerable delay occurring in the supply of spare parts from England, but the mileage run shows a substantial increase and, in spite of the higher cost of materials and wages, running expenses have decreased. From April to December, 1920, goods totaling 4742 tons were carried as compared with 5091 tons handled throughout 1919.

Private contractors have supplemented the Government service, more especially in the cotton-growing districts of the eastern province. There has been a steady influx of motor cars and motorcycles and the extensive use of motor transport is certainly warranted by the excellence of the roads.

For the purpose of testing the Stronach-Dutton system of road rail transport an experimental line four miles in length was laid.

The trials proved extremely satisfactory, and in view of this it was decided to purchase 50 miles of track with the necessary rolling stock and to construct in the first instance a line from Kampala to Bombo and Kalule, some 26 miles.

An effort is being made to interest native landowners in the advantages of motor cultivation. It is recognized that demonstration in improved agricultural methods is essential to proper progress in the development of agriculture and steps are to be taken to provide the necessary instruction. The success of this movement will mean a demand for tractors.

In the near future, too, will come a demand for motorboats, for this type of vessel is especially suited to tap the economic resources of the shores of Lakes Victoria, Kioga and Kwania.

FRENCH WEST AFRICA, totaling nearly 1,000,000 sq. m., has but 245 motor vehicles. If the ivory coast has its share of this poor total, it possesses 31 automobiles. Yet the Ivory Coast roads are truly wonderful. A party of tourists recently returned from the country and stated that 2000 kilometers of smoother roads could not be found anywhere in the world. Most of the resources common to West Africa abound in the Ivory Coast. Apparently the one thing necessary for the country's development is motor transport to use these fine highways.

Exports of Passenger Cars, Trucks, Tires, Tractors,

COUNTRIES	GASOLINE PASSENGER CARS						GASOLINE TRUCKS						PARTS	ELECTRIC PASSENGER CARS AND TRUCKS	
	Up to $800		$800 to $2000		$2000 and over		Up to 1 ton incl.		Over 1 to 2½-tons		Over 2½ tons				
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	Value	No.	Value
Europe															
Azores and Madeira Islands			1	$1,400			4	$1,699					$54		
Belgium	32	$19,716	17	18,219	9	$27,900							12,703		
Czechoslovakia	2	864													
Denmark	25	16,042	18	18,645			1	250					132,268		
Finland	10	3,835					10	4,247					343		
France	1	800			3	8,000							66,458		
Germany	1	110	3	2,765					10	$15,000			3,542		
Gibraltar			1	815									20		
Greece	18	8,697											3,779		
Hungary															
Iceland and Faroe Islands													486		
Italy	2	1,000	5	7,217	1	10,000							7,591		
Lithuania													276		
Malta, Gozo and Cyprus Islands	38	14,039			1	2,500							1,644		
Netherlands	50	32,313	9	9,369			10	4,247	4	6,365			9,481		
Norway	38	16,912	1	827			32	13,591	3	2,813			3,097		
Poland and Danzig													35		
Portugal	1	60	1	1,060									1,589		
Roumania	4	1,516											2,248		
Spain	53	35,094	44	50,949	7	18,312			2	2,000			28,054		
Sweden	94	55,663	52	52,999	1	2,500	15	6,371	2	2,112			15,303		
Switzerland	8	5,792	10	10,883	3	8,880							2,209		
Turkey in Europe	1	750	1	1,800											
Ukraine															
England	111	43,597	91	103,933	2	10,000	5	3,868					423,933		
Scotland	24	15,216	11	10,307									401		
Ireland	4	2,205	3	2,784	1	4,800	1	506					5,200		
Yugoslavia, Albania, etc.	1	526											2,787		
Latvia											2	3,800			
North and South America															
Bermuda													66		
British Honduras	1	422											717		
Canada	359	213,004	443	530,370	65	184,985	32	23,632	51	72,547	27	66,725	1,736,658		
Costa Rica			1	890									971		
Guatemala	4	2,896											841		
Honduras	6	2,634	3	3,818					1	200			1,254		
Nicaragua													187		
Panama	1	800	2	1,976			2	849					2,745		
Salvador	3	2,172											377	1	$1,809
Mexico	412	194,236	161	181,183	23	59,086	23	13,270	8	9,550	4	14,626	112,310	1	62
Newfoundland and Labrador			1	920									2,563		
Barbados													855		
Jamaica	11	4,692	4	3,962			7	2,972	1	1,610			7,270		
Trinidad and Tobago	10	3,962							1	1,524			11,745		
Other British West Indies	5	2,218	2	1,950	2	6,700	3	1,099	2	3,846			1,553	1	300
Cuba	123	50,037	17	23,197	13	36,834	30	14,684					73,482		
Dominican Republic													3,421		
Dutch West Indies	3	1,152	1	1,350					1	2,000	1	3,500	2,673		
French West Indies													1,373		
Haiti	5	2,753	8	10,450									2,791		
Virgin Islands of U. S.	1	150											705		
Argentina	113	79,630	91	99,582	8	29,458			8	10,874			421,480		
Bolivia													307		
Brazil	22	15,448	77	77,698	3	10,384							15,176		
Chile							8	3,397	1	1,052			9,493		
Colombia	3	1,846	1	1,241			2	849					5,443		
Ecuador			1	1,379									1,790		
British Guiana	3	2,172											2,054		
Dutch Guiana													64		
Paraguay	1	800													
Peru	4	1,498	1	1,000			1	500					11,315		
Uruguay	10	7,240											17,497		
Venezuela	17	7,313	4	4,221	1	2,878							7,102		
Asia															
Aden													177		
Ceylon	13	8,716	2	2,021									434		
China	16	12,017	18	20,817	1	2,500	8	4,350	1	506			5,096		
Kwantung	15	7,092											4,684		
Chosen													1,105		
British India	41	29,583	45	41,966					10	13,564	8	8,999	37,829		
Straits Settlements			1	984									6,636		
Other British East Indies													15		
Other Dutch East Indies			7	6,957									2,445		
Java and Madura			26	27,502	3	9,732							37,864		
French Indo-China									1	1,080			2,748		
Hejaz, Arabia and Mesopotamia													2,261		
Hongkong	1	300	3	2,691									3,201		
Japan	109	44,372	31	33,467	9	36,171	100	49,888	15	27,876	4	8,967	36,036	21	41,760
Palestine and Syria	21	9,538	6	6,048			33	14,016					17,492		
Philippine Islands	29	16,736	19	19,749	4	13,723			4	6,760			39,296		
Greece in Asia													1,199		
Siam	4	2,896											762		
Turkey in Asia	3	1,191													
Oceania															
Australia	477	298,679	306	312,799	3	9,251	7	5,911	28	40,809	2	2,513	117,467	12	8,817
New Zealand	46	32,439	55	58,820					13	19,678			29,221		
Other British Oceania													294		
French Oceania	3	1,356											474		
Other Oceania													595	1	600
Africa															
Algeria and Tunis	15	6,159													
Belgian Kongo	5	2,124					15	5,376					13,622		
British West Africa	23	15,730	3	3,599	1	2,064			3	3,210			5,850		
British South Africa	49	35,468	117	117,709	2	5,930	5	3,978			3	11,500	27,714	4	3,978
British East Africa	3	2,172											326		
Canary Islands	2	1,210							3	2,889			4,409		
French Africa	7	3,215											1,397		
Egypt	54	23,333	3	4,487			12	5,247					9,127		
Morocco			4	3,232									5,881		
Portuguese Africa	2	689											11		
Portuguese East Africa													1,895		
	2,573	$1,426,837	1,732	$1,902,007	166	$502,588	366	$184,797	173	$248,865	51	$120,630	$3,596,539	41	$57,884

Motorcycles and Aircraft for March, 1922.

TIRES						FARM TRACTORS		PARTS	MOTORCYCLES		AIRPLANES AND SEA-PLANES		PARTS	COUNTRIES
Casings		Inner		Solid										
No.	Value	No.	Value	No.	Value	No.	Value	Value	No.	Value	No.	Value	Value	
														Europe
16	$201								2	$438				Azores and Madeira Islands
532	7,172	503	$945			11	$6,636	$769	112	31,461				Belgium
									2	539				Czechoslovakia
3,953	58,437	4,596	7,793					782	130	33,668				Denmark
91	2,312	144	432						52	12,595				Finland
2,162	25,898	784	1,426	16	$1,024	7	3,740	4,790	28	7,803				France
122	3,251					1	140	40	15	4,439				Germany
12	132													Gibraltar
1,417	16,707	1,089	2,021	10	386				1	56				Greece
								189						Hungary
92	622							22	122	26,451				Iceland and Faroe Islands
														Italy
124	1,264	24	57			1	383	80						Lithuania
1,537	24,850	702	1,783	39	708			49	185	53,619				Malta, Gozo and Cyprus Islands
1,237	28,424	962	2,156	88	2,635				12	3,733				Netherlands
3,936	81,503	6,480	37,025			1	480	1,779						Norway
132	2,325	288	737											Poland and Danzig
								85						Portugal
1,145	17,106	363	706	205	4,220	4	5,100	1,245	6	1,922				Roumania
3,610	69,059	2,017	5,697	20	324			1,318	35	11,251				Spain
156	2,396	69	165					270	30	8,697				Sweden
272	3,816	482	873			13	5,487	498						Switzerland
						4	1,958							Turkey in Europe
41,936	402,885	14,464	21,713	746	14,752	1	826	16,999	57	15,024			$70	Ukraine
347	5,163	140	265											England
21	387	17	37					22,616						Scotland
322	6,112	430	800			1	387							Ireland
10	104					8	11,645	77						Yugoslavia, Albania, etc.
														Latvia
														North and South America
37	434	4	9			2	676	920						Bermuda
4,549	65,524	3,168	7,073	275	7,554	211	111,649	34,798	122	31,964			2,456	British Honduras
283	5,807	142	422											Canada
34	856	34	79	4	86			189						Costa Rica
92	3,279	78	202	44	1,765	1	472	135						Guatemala
26	468	18	30											Honduras
830	11,123	820	1,674	26	626	2	619	243						Nicaragua
77	2,557	73	279											Panama
7,421	96,882	6,383	11,705	139	3,652	18	20,368	51,886	5	1,440	23	$19,850	270	Salvador
17	152	18	34					130						Mexico
134	1,661	63	113	6	200									Newfoundland and Labrador
736	9,679	671	1,241	66	2,051			58	1	50				Barbados
639	10,277	313	810	62	1,413	2	5,657	798	1	335				Jamaica
159	1,626	181	445											Trinidad and Tobago
8,202	107,736	6,320	11,884	695	22,420			8,111	1	100				Other British West Indies
881	10,436	1,253	1,886	18	500			1,845						Cuba
72	1,389	132	270					27						Dominican Republic
647	8,018	162	358	49	1,080			46						Dutch West Indies
226	3,053	303	582					99	1	376				French West Indies
152	2,005	116	228					126	1	100				Haiti
7,686	94,816	5,105	10,128	160	1,944	210	83,034	1,836	74	19,941			291	Virgin Islands of U. S.
66	1,000	31	250						2	440				Argentina
6,536	70,421	4,055	5,373	84	1,566									Bolivia
1,598	15,998	1,014	4,569	87	5,648			559						Brazil
697	12,100	601	1,265	10	249	1	364	3,988						Chile
174	3,264	140	322	4	218				1	301				Colombia
172	2,112	203	417											Ecuador
														British Guiana
24	188	4	5											Dutch Guiana
2,269	36,505	975	2,224	32	728			2,530	2	224				Paraguay
3,123	42,738	1,337	2,044			25	9,115		13	2,900				Peru
2,090	22,638	1,735	3,347	4	134			6,573						Uruguay
														Venezuela
75	831	75	131											Asia
233	3,240	65	93	12	141			159						Aden
691	13,062	437	1,020											Ceylon
														China
6	101	6	14											Kwantung
2,527	28,133	2,821	4,984	622	16,768	9	42,915	4,869	1	475				Chosen
8,360	78,079	3,525	4,880	489	11,665	1	4,716	1,203					100	British India
														Straits Settlements
460	4,863	424	631					261	1	100				Other British West Indies
3,860	58,695	2,033	5,689	50	2,128			3,054	44	11,526				Other Dutch East Indies
82	1,156	72	288					1,058						Java and Madura
		240	599											French Indo-China
														Hejaz Arabia and Mesopotamia
626	6,579	400	400	80	1,357	15	6,078	2,142	85	15,717				Hongkong
1,011	10,104	575	1,052					184						Japan
5,595	78,873	5,261	9,790	444	9,934			62						Palestine and Syria
46	1,375	32	108						1	170				Philippine Islands
		10	59	10	617			369						Greece in Asia
20	230					1	381	80						Siam
														Turkey in Asia
3,733	64,297	1,053	2,874	219	6,918	4	5,802	4,426	364	88,223				Oceania
3,692	64,836	1,905	6,101	210	9,719	1	652	237	32	9,518			43	Australia
10	95	12	26	2	44									New Zealand
24	454	36	81	9	246									Other British Oceania
4	79													French Oceania
														Other Oceania
								15						Africa
373	6,421	617	1,164			9	3,523		4	418				Algeria in Tunis
4,307	60,084	4,800	7,689	1	21			82	13	3,178				Belgian Kongo
208	2,277	238	500											British West Africa
240	1,902	220	347	6	250									British South Africa
150	1,824								1	184				British East Africa
1,425	14,236	329	517					837						Canary Islands
34	517	40	75			1	291	12	14	2,663				French Africa
8	138													Egypt
20	358													Morocco
														Portuguese Africa
														Portuguese East Africa
150,651	$1,907,647	94,232	$203,011	5,043	$135,691	565	$333,094	$185,555	1,573	$402,039	23	$19,850	$3,230	

Credit Requirements Have Outgrown Facilities for Financing Car Sales

Present methods of handling time-payment sales are inadequate for volume and value of business done. Retailers unable to furnish necessary credit machinery. Factors which bear on financing automotive sales are more complex than in other industries, hence new methods are needed.

By Harry Tipper

THE problem of financing the sales of automobiles in the retail field is one of very much larger proportions than the financing required for the sale of any of the other types of commodities which are sold to a considerable extent upon time payments. An investigation into the retail field showed that in 1920 approximately 52 per cent of the total retail sales in the automotive business was represented by the sale of passenger cars. Seventy-five per cent of this 52 per cent involved time sales. Approximately 40 per cent of the total money in the business, therefore, is involved in financing time payment sales. This is a much larger proportion of the total involved in the whole business than is absorbed by time sales in any other line of retailing, and in several other respects the problem is different and more difficult to cover thoroughly. A large number of these sales represent trades involving the turning in of the old car in order to complete the transaction on the new car. The transaction in these cases involves a loan on the original car; a mortgage on the proportion of the new car for the proportion of the sales involved; and the sale of the used car.

THE growth of time-payment sales in the automotive industry has been such that in 1920 approximately 75 per cent of passenger car retail sales were made in this manner.

The difficulties which attend the safeguarding of financed sales limits the extent to which the local banks can aid the retailers in handling this large volume of business.

Some of these difficulties can be overcome by the use of centralized clearing houses of information as used in the conduct of other businesses.

From this consideration of the total volume involved in the financing of time payment sales, it is evident that the retailer cannot be expected to do this financing in the way that such matters are being handled in other retail fields.

It is evident also that there are difficulties in securing all of this financing from local banks because of the other conditions involved. Other means of financing are probably necessary in a large majority of cases and the proper working out of these methods is a very important item for the automotive manufacturer.

Some corporations have been developed for the particular purpose of financing retailers on individual car mortgages and corporations of this kind are likely to be necessary if this financing is to be kept stable and orderly.

The depreciation between the price of a new car and the price of a second hand car introduces a larger element of risk in connection with this time payment method of sales and makes the financing more burdensome. Furthermore, this depreciation is complicated by the condition in which the owner keeps his car and the attention he pays to its servicing and maintenance. To the bank there are other difficulties, more important than these, which have become visible in the rapid growth of the business and the entry of so many new retailers into the field in a short time. These difficulties are concerned with the necessity of following the chattel mortgage on the car so that there can be no duplication, no substitution, and the property can not be moved out of the range of the mortgagors. To some extent these difficulties are presented in other cases of retailing where time payments are a necessary part of the transaction. They exist in a more difficult form in the automotive business because the product itself is simply a means of transportation. It is possible for the retailer to duplicate the mortgages and to cover the transaction so that the duplication is difficult to unearth and the car itself is moved about with so much ease that it is a somewhat difficult matter to keep it within the range of action necessary to protect the mortgagor and to secure a constant steady payment of the instalments.

This problem has not been met thoroughly and the financing of automobile sales will be surrounded with some difficulty until it has been worked out by whatever means are necessary to secure thorough co-ordination. Fluctuating prices add to these difficulties, of course, because the value of the article seized for non-payment is somewhat uncertain; and the amount to be spent in its reconditioning, and the amount to be secured from its sale, are factors that cannot be determined within narrow limits.

In other lines of merchandising, the amount involved in the time payments is not a sufficient proportion of the total business done by retailers in those fields, to make it a difficult matter to overcome in the general credit of the retail establishments or in the credit relations between the retail establishment and the manufacturers from whom they buy. In this field, the amount of money involved is a very considerable proportion of the total gross business done by the retailer because it averages between 38 and 40 per cent. and, in many of the establishments devoted primarily to the sale of cars, the proportion of gross income involved, in the sale on credit, is very much larger.

Consequently, the stability of the retail outlets of any manufacturer and the flexibility of his own credits are more directly involved in the proper arrangement of this financing of time sales so that the financing will be orderly, surrounded with the proper safeguards, and easily arranged. Banks and other financial institutions cannot be expected to loan as much money on individual chattel mortgages for automobiles so long as the uncertainties involved in this type of transaction are as considerable as they are to-day.

In other lines of retailing, the elimination of some of these credit evils with the individual consumer have necessitated centralized clearing houses of information so that the dishonest retailer or consumer will be automatically discovered by the exchange of information on the individual credits and the individual mortgage transactions. In these older lines, the business has settled down to a regular procedure; is absorbed in the ordinary transactions between the retailer and his bank, and does not disturb (to any great extent) the credit relations involved in the flow of the business.

Up to the present, it has been difficult to reduce the credit losses in such transactions in the automotive field, to a safe percentage because of the lack of centralized systems whereby the information would be properly cleared and the conditions properly observed. In a field growing as rapidly as the automotive field, bringing into its distribution and sales so many new establishments each year, some of the people starting in business in the retail side would be tempted to make money by dishonest methods of dealing with time payment sales, bank credits on cars, and similar credit transactions.

IT is perhaps amazing that the business should have reached its present point with so little trouble from these difficulties, considering the rapidity with which it has grown and the number of retailers who have come into the business within the last five years. In view of the present, and the probable future, market conditions, however, it is not likely that the percentage of time sales will decrease, so that the credit transactions will require a closer and more careful consideration of the stability of the individual buyer; the profit or loss involved in the trade of the used vehicle; the depreciation in the price of the new vehicle; and the safeguards against fraud or lax methods of doing business, which must be instituted by the financial concerns who advance money to the dealers on such transactions.

Because of the difficulties involved in this situation, a number of concerns have grown up who make it a business to finance individual mortgages on automobiles sold on time payments, and these companies report a comparatively low percentage of fraudulent transactions although they have found it necessary to mark retailers who have been involved in questionable deals, and of late, several of them have found it necessary to exchange information through a central clearing house in order to limit the number of these questionable transactions.

ONE of the great difficulties has been the elimination of duplicate mortgages on the same machine. Various methods have been resorted to by retailers, sometimes in collusion with their customers, in order to secure a larger credit from the financial institutions than the actual transactions would permit. In the large cities, this difficulty has been considerable and has arisen mainly because of the lack of thorough information regarding the mortgages issued by the various concerns to various retailers on particular cars and, consequently, the possibility of the retailer securing additional mortgages through different institutions on the same vehicle.

A similar difficulty has been found from time to time in establishing the credit of the mortgagee, or individual owner, and in maintaining a definite hold upon the vehicle until the payments have been completely disposed of. Without a thorough co-ordinated system of handling such matters, it is difficult to act, if a car is taken out of the locality. It becomes more difficult when the state line is crossed, and the difficulty is not lessened when the owner disposes of the car to some other party.

The restrictions which must be put upon the loaning of money by banks makes it impossible for the banks to go as far as they should go for the necessities of the industry in the matter of credits on automotive sales. The amount involved in these credit transactions is too large a percentage of the total gross business to enable the retailer to finance the considerable portion of it himself, and so get along with the bank credit and his own financing.

Out of this situation, the special financial institutions for financing dealers on individual mortgages have been established, but their work is still very fragmentary and the present system is not sufficiently developed to fill the probable needs of the industry in the near future.

Some further discussions on these institutions is important, and an article will be devoted to this subject in the near future.

Proposed French Horsepower Formula for Taxation Omits Engine Speed

A HORSEPOWER formula for taxation purposes which will ignore engine speed has been proposed by the technical services of the French Government. At present automobile taxation in France is largely based on horsepower, and the power is determined by a formula which takes account of bore, stroke, number of cylinders and number of revolutions.

Under the new formula horsepower will be calculated on piston displacement only, the basis being one horsepower for 12.2 cubic inches with a four-cylinder engine. When the engine has more than four cylinders the horsepower will be calculated at the rate of one per 14.03 cubic inches. For twin cylinders the rate will be one per 10.98 inches and one per 9.15 inches for single cylinder engines. This basis only applies to passenger car engines, which are assumed to run, on an average, at 1600 revolutions a minute. For truck engines, which always run at a slower speed, horsepower will be at the rate of one per 18.3 cubic inches for a four-cylinder engine. For more than four cylinders the rate will be one per 21 cubic inches of piston displacement.

Generally speaking, the new formula, if adopted, will give an advantage to taxpayers, this advantage being most pronounced on big cars. While the Ford will remain at 14 hp., the Cadillac will drop from 36 to 22 hp. and the Rolls-Royce from 40 to 32. The Liberty truck, which is at present rated at 32 hp., will be taxed at the rate of 23 hp.

The great advantage of the new formula is that it is simple and easy to apply and will eliminate all the discussions which have taken place in the past between automobile owners and the taxation authorities.

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Nothing More Important

MARKETING problems are more important today than any other problems facing the industry. Because the marketing trail has not yet been blazed in the automotive industry, study and thought of a fundamental character are essential.

The chief executives of the various plants are the only men thoroughly capable of thinking out and putting into motion these fundamental plans. The study necessary will demand considerable time; it will require hard study of facts and statistics; it will make the executive think he is back for a time in the little red schoolhouse. But the whole structure of the individual company and of the industry rests upon the proper solution of these problems. Whatever time is necessary for detailed study and analysis is fully worth while for a highly paid executive.

It is false economy for the executive to pass over to a subordinate a major part of the market research task. Such action is logical where the general principles of procedure and methods are pretty well recognized everywhere. In the case of the marketing problems of the automotive industry, however, investigation is in a primary stage. Original thought and study by thoroughly competent men are necessary.

Thomas Edison did not turn over to subordinates the details of his electrical research until he had fully determined the principles and laws of operation. He did not make his discoveries and inventions without much thought and analysis of collected detail data.

Inspiration and Perspiration

AN automobile dealer in China says that a large part of his business comes from the desire of Chinese people to have an automobile in a parade. Strange, isn't it, the things that make people want to buy motor vehicles? Nevertheless, the best way to sell cars is to find out as intimately as possible what buyers want and then try to give it to them.

The "parade" stage of the automobile has passed many years ago, of course, so far as the United States is concerned. Different things influence buying today. These things have changed materially during the last decade and will change materially during the next decade. The motor vehicle salesman has on his hands the difficult task of keeping up with these changing influences. He must know what they are, when they change, how they change, and how they can be met. Selling automobiles is a dynamic problem; it cannot be solved on the basis of a static economic survey. Changing forces of buying habit must be studied.

Buying values fluctuate constantly. Economic conditions change periodically. Mechanical design is constantly improved. All these tend to make planning difficult in the field of automotive sales and production. But they emphasize the necessity for a careful accumulation of accurate data, a constant study over that data, and an intelligent interpretation of past trends as a means of predicting future progress of reasonably long business periods in the future. The difficulty simply emphasizes the necessity. Inspiration will never take the place of perspiration.

Used Car Solutions

RECENT discussions concerning the used car problem have brought forth many suggestions for its solution which, although valuable, have for the most part a common weakness. Briefly stated, this weakness lies in the fact that they are made from the manufacturer's viewpoint and not from the dealer's; that they deal with minor phases rather than with fundamentals. This latter is perhaps to be expected when a subject is comparatively new as regards application of any concentrated study.

It must be remembered that the adoption of suggestions to an individual concern which apply to every concern in the industry, would in many cases place a terrific competitive pressure on the individual dealer and thereby disrupt the sales force. This must be foreseen or the dealer organization will suffer from a lack of intelligent co-operation.

When suggestions are made for the industry as a whole, the competitive nature of the industry must

not be forgotten. They must be adopted by all, or they lose value. There must be concerted action.

If we would make an improvement in the used car situation a great deal of investigating, analyzing and right thinking must be done, with the retail sales organization, not the factory, as the source of information. The difference between minor phases and fundamentals must be recognized. There is no short cut to the solution and any attempt at taking one will lead to pitfalls. By all means let us have action but let us understand the potentialities before the start.

Representation

OF all sales which will be made during this year, 90 per cent will be to persons already owning cars. These owners will make their choice depend largely on the character of the service rendered by dealers in their locality. This fact makes success depend for the major part on the ability with which local representation is chosen. Evidence that this is true may be seen daily in almost any territory.

That the importance of this fact is not fully appreciated by all manufacturers and likewise distributors in turn is evidenced by the different methods employed to pick representatives, and the ease with which contracts can, in many cases, be secured when really against the company's interest in the long run.

The manufacturer may consider it strictly a problem for the distributor, and it is no doubt often arranged so that it appears to be on the face of it, but fundamentally it goes much deeper. With proper supervision, good representation may be secured without taking initiative from the distributor.

The industry as a whole, suffers whenever local representation is poor. With a sound knowledge of the automotive market and quotas established on a basis of this knowledge rather than on optimism, there would be no place, no economic value in a method which would permit unsound representation to exist.

An Instruction Book Suggestion

CONSIDERABLE ingenuity is being displayed by the larger manufacturing organizations in getting up instruction books which tell the owner exactly what to do to keep his car in good running order. More attention is generally given to the lubricating system than to any other part. The requirements of the various bearings are made clear, so that the owner has no excuse for neglecting them. Manufacturers have come to recognize that neglect to attend properly to the oiling of a car is responsible for rapid wear and depreciation, and that such abuse on the part of owners will give their cars a bad name in the neighborhood. To oil and grease some thirty or forty more or less inaccessible joints on the chassis is a rather onerous task in any case, and should be eased as much as possible by proper instructions.

A rather interesting innovation in instructions for chassis lubrication has been made by a well-known manufacturer of cars. A plan view of the chassis occupies the center of the chart, with little circles around the points that need periodical lubrication. Reference lines extend from these circles to enlarged photos or "close-ups" of the points to be lubricated, arranged on a border panel. Some of the points on the chassis are necessarily rather inaccessible, and this chart enables the operator to familiarize himself with the exact location of the oil hole, etc., without going into contortions.

Removing Misunderstandings

OVERLOADING trucks has caused much sorrow to owners as well as highway authorities. With the idea of removing this trouble, many manufacturers have made an effort to regulate more closely the load carrying of their products by selling trucks with a definite understanding with the buyer and informing the authorities handling registrations what the maximum load limits are.

The Transportation Engineering Department of the Packard Motor Car Company has recently published a bulletin which contains specifications of all models of their trucks produced since 1905, with special reference to load carrying capacity ratings and chassis weights. This bulletin is sent to all municipal and highway authorities as well as to the selling organizations with the understanding that all their trucks will be sold on the basis of the information contained therein.

This may be taken as a distinct step forward in removing the misunderstandings which arise between what a truck is supposed to do and what it is sold to do and that between operators and highway authorities. It should also tend to remove sales resistance arising from such misunderstandings.

Sport More Efficient Than Business

SPORT is more efficient than business. That statement is one to which many will take exception, but it is a fact. For example, the history of baseball is one of the most carefully preserved records of human activity that exists. It is possible to find records of every game since baseball was an established sport and the records are specific as to names, places, exact dates and character of the plays made.

The automotive industry may well envy these records. If the like existed for automobiles the wealth of valuable material that could be secured from analysis and compilation would pay many times over for the cost of collection and market analysis would have a concrete foundation on which to build.

The size and importance of the automotive industry demands that we follow the example set. Statistics which seem trivial can furnish more value to the manufacturer and the public at large than ever can be secured through statistics of sport.

Many realize the need of collecting data regarding the industry. It is not enough that a few should recognize the importance of such procedure. The value of data collected depends in a measure on their completeness, hence the industry as a whole must secure the desired material. Data lost can never be regained.

Orders Keep Plants at Top Speed

No Let Up Is Likely for Month at Least

Despite Good Outlook, Car and Truck Manufacturers Continue Cautious

By JAMES DALTON

NEW YORK, May 23—It now is no exaggeration to say that the manufacturers of practically all popular lines of passenger cars are far behind on orders. There is no doubt that May will be the biggest production month the industry ever had, and unless there are wholesale cancellations of orders now on the books of dealers, the business in sight will keep the plants going at top speed until the middle of July.

If cancellations are in prospect there are no indications of it now. Buying is as brisk as it has been for two months. As demand slackens slightly in one section of the country it shifts to another so there is no diminution in the total. Farm buying will not begin in earnest before July 1.

While the industry is running at capacity, most car and truck manufacturers are keeping a weather eye out for squalls and up to this time they have shown no disposition to cast caution aside as they did when buying was at its peak in 1919 and 1920. It is admitted that they have ample plant capacity to meet all needs for a long time to come, except in isolated cases.

Shortage of Malleables

There is a shortage of certain parts and materials, notably malleables, but the parts handicap is not so pronounced as it was last month except in the case of bodies. All the year-round demand for closed cars has increased sharply in the last year, with falling prices for models of this type, and body manufacturers have been unable to keep pace with it. It is probable there will be some expansion of plant facilities in this field to meet changing conditions.

Few vehicle manufacturers are making commitments for more than 60 or 90 days and they are not accumulating inventories. While they do not now expect any sudden sharp falling off in demand they propose

(*Continued on page* 1142)

Business in Brief

NEW YORK, May 22—Business and industry generally continue on the up-grade, and increased optimism becomes apparent week by week.

The entire steel industry is approaching normal, with operations at about 80 per cent of capacity, or double the output at the low point. The most encouraging factor is the placing of substantial orders for delivery the last half of the year, showing reversal of the hand to mouth buying policy. Output for May will exceed April.

Crop conditions are more favorable, and sentiment in the agricultural districts is vastly improved. World consumption of cotton has been restored almost to normal. Acreage has been increased, and the outlook for cotton growers is exceedingly bright.

There have been fresh advances in cotton, cotton textiles, wool and woolen goods, and some improvement in hides, leather and shoes. The new wool clip has advanced fully 20 per cent in the eastern markets and rather more in the west.

Continued activity and price strength is shown in the construction trades. Lumber, builders' hardware, mechanics' tools, cement and paint, all are strong.

Stocks are strong, bonds quiet, money is easier and sterling firmer.

Bank clearings for the week ending May 18 were $6,990,653,000, a loss of 2.7 per cent from the preceding week, but a gain of 6.5 per cent over the same week last year.

Freight car loadings in April, except coal, showed an increase of 286,353, or 15.91 per cent over April of last year.

DURANT MAKING 275 DAILY

DETROIT, May 22—Durant production in all plants is now at a rate of 275 daily, according to a statement from the Lansing office. At the local plant 100 are being made, which is about the same as at Long Island City. Thirty are turned out at Leaside, Ont., and 40 at Muncie.

HEADLIGHT MEETING JULY 17

NEW YORK, May 23—Highway departments of ten Eastern states will send representatives to Baltimore, July 17, to adopt, if possible, uniform lighting regulations. Some of the states now favor the present Massachusetts headlight laws.

Ford Demand Brings Big June Schedule

Company Estimates Car, Truck, Tractor Output for Month Will Total 140,000

DETROIT, May 19—Ford dealers in the United States have asked for 194,750 cars, trucks and tractors for June delivery, according to a factory statement today. As a result the estimated output for June has been boosted to 140,000, an increase of 10,000 over May and a new high production month. The tractor output will approximate 10 per cent of the gross figures.

Ford sales have been constantly increasing since the first of the year, the statement says, the demand growing in the past two months faster than it is possible to increase production. On May 16 a new production mark of 4878 for a single day was set. This was an increase of 15 over the day before, the previous record bearer. On May 18 the 6,000,000th Ford engine was assembled. Five and one-third seconds afterward number 6,000,001 was built. The first model T engine was made Oct. 1, 1908; the 1,000,000th December 10, 1915, and the 5,000,000th May 28, 1921. The present numbering system began with the first Model T, although a number of different models were manufactured previous to 1908.

Building 5400 Engines Daily

The engine department at the Highland Park plant is now building 5400 engines daily which are shipped in carload lots to Ford assembly stations throughout the country for assembly in cars. A number of these are used for replacements, but the bulk go into new cars and trucks.

Of the 6,000,000 cars and trucks made since 1908 the company notes that 5,517,956 were delivered to purchasers in the United States alone and that 4,472,248 of these are still in service. Distribution of these has been even in all parts of the country, the sparsely settled Mid-western States showing practically the same ratio as densely populated sections. In the East, Ohio has the highest number of Ford cars registered, the statement says, the total showing 290,769. Illinois is second, Pennsylvania third, Texas fourth, and Michigan fifth.

ASK TOWNSEND TRUSTEE

JANESVILLE, WIS., May 22—Creditors of the Townsend Manufacturing Co., manufacturer of tractors, have applied for a trusteeship to facilitate a reorganization. The concern will continue to operate in the meantime. A hearing will be held in the bankruptcy court at Madison on May 26.

May Will Set New Production Mark

Factories Operating At High Efficiency

Night Work on Established Basis in Most Plants—Some Supplies Run Low

By D. M. McDONALD

DETROIT, May 22 — Production marks which have been climbing steadily in practically every factory in the Detroit district since early spring, will reach their highest point in the last ten days of May. With scarcely an exception, new production marks for a single month will be set unless there is a combination of circumstances now unforeseen to prevent.

Material is now being received in quantities to meet requirements, and men who have been added to the factory forces in the past two months are at high efficiency. More men are being added daily in all factories, especially the body plants, which have found it necessary to break in new men in the absence of recruits from skilled ranks.

Night work, up to this time more a matter of day to day decision, is now on an established basis in the final assembly departments of most plants. Now the night schedules have been posted several days in advance, so workers might make necessary preparations. Sunday work for the present is an accepted fact and Saturday afternoon holidays in most plants have been abandoned.

Change in Unit Parts

In the stress of getting cars out on schedule a number of companies have adopted unit parts of makes other than their own to help speed up and to overcome shortages of labor. Though this is for the most part an arrangement made necessary by the heavy production strain, there is certainty that in several cases these parts will be permanently incorporated in the make-up of cars, as announcements of various models later on will show.

Tool supplies in many of the factories are getting low. Some plants which thought several months ago that they had an inexhaustible inventory on the high speed cutting tools and others are coming into the market for supplies, and companies which make a business of salvage work are now among those working nights to keep up with demands.

Despite the speed and the addition of hundreds of new men in recent weeks, inspection on work is being kept very strict. The spirit of building for the future is manifest. The cars of May, which probably will be the highest production month the industry has known, will be as mechanically perfect and exact as the cars built in the height of the slack season last year.

One of the developments of the dull period was the building-up of a very strict inspection on the part of distributors and dealers of new cars before turning them over to the owner. This dealer inspection is now a bulwark against the possibility of inferior work reaching the final owner. There is no record of any cars being turned back to the factories, which is an indication of the high grade of workmanship insisted upon.

Temptations are very strong upon the factory sales organization these days to divert shipments to certain quarters, but all requisitions are being treated strictly on a proportionate basis. Distributors are continuing to visit factories to urge greater consideration of their particular needs, but they are getting only what the factory originally selected. Trainload shipments have gone out of fashion for the present.

Rate of Improvement in Industry Depends on Pace of General Business

By C. S. MOTT,

Vice-President of the General Motors Corp. and Chairman of the Advisory Committee

DETROIT, May 22.

THE owning of an automobile is getting to be more a matter of business every day. As individual transportation of a quicker and more comfortable nature than any hitherto known, the automobile fills every important need in general business life. Because of the improvement in general business the automobile industry is to-day experiencing a very satisfactory business.

Whether the automobile business is to continue at the present rate is largely a matter of whether it has been outdistancing by too wide a margin the general improvement in other lines. If it has, there may be expected a recession until other business has advanced to a point where the need for transportation again asserts itself.

The automobile as a means of business will always be in the advance of a general business movement. It is because of this that the industry was favored with the big buying movement of the present season. It is a season that was confidently looked forward to in the industry, though in volume it has exceeded the early expectations.

Because of the general use of the automobile in business the standardized production vehicle of to-day will continue to be generally accepted. The desire for individuality in car design or appearance is the exception, but will be met by manufacturers at higher prices as affording a certain volume of outlet for their product.

Steady progress is being made toward reducing the operating and maintenance costs of automobiles, and as these improvements are perfected and incorporated into present vehicles there will be an increasing market for the manufacturer. New price classes will be opened in the next five years which will bring thousands of potential owners into the buying market.

The development of highways in the next few years will also have an important part in the general advance of the industry. As it makes it more possible for owners to realize on the inherent time saving capabilities of their vehicles, they will become more and more indispensable in business. Indiscriminate speeding as it is known to-day will be eliminated with the construction of highways with space for both fast and slow moving vehicles. There is also much to be accomplished in the perfection of safety devices and provision for overhead crossings in cities.

267 Delegates Attending Argentine Roads Meeting

BUENOS AIRES, ARGENTINA, May 23 (By Cable)—The Argentine National Good Roads Congress, the first ever held in South America, opened here yesterday with an attendance of 267 delegates, representing national, state and municipal governments, trade organizations and business houses. The congress is performing its work through daily conferences and in three committees, devoted to finance, legislation and road construction. The impression prevails that the congress will pave the way for the construction of a permanent system of public highways.

The Argentine road congress is being held at the instance of the Touring Club Argentino, one of the important automotive associations of Buenos Aires, for the purpose of working out a national highway plan for the Republic. Information received here indicates that it has attracted wide interest and attention and that all parts of Argentina are represented by delegates.

Firestone to Build New Plant in Canada

Present Plans Call for Initial Capacity of 3,500 Tires Daily —Company Shows Profit

AKRON, May 22—The Firestone Tire & Rubber Co. expects to start work soon, it is reported, on a new tire building plant at Hamilton, Ont. Firestone secured the site for the Canadian plant during the war, but deferred building operations. Under present plans the Canadian plant will have an initial capacity of 3500 tires daily.

The Firestone factory in Akron is now producing 25,000 tires a day. This is nearer to proportionate peak output than of any other of the major tire companies in Akron, with the exception of the Miller Rubber, which is running in excess of its 1920 peak of 6000 tires a day. Firestone's peak was 28,500 casings daily.

For the first six months of the Firestone fiscal year, which began Nov. 1, an operating profit of approximately $2,500,000 is reported. This includes the six month period up to May 1 and does not cover the past 60 days during which the tire industry has taken an unprecedented spurt, indicating that the Firestone operating profit for the next six month period will be proportionately much larger.

Goodrich on 8-Hour Shifts

This substantial operating profit does not necessarily mean resumption of dividend payments, it is understood, as the company at the end of its last fiscal year had $21,000,000 in notes and acceptances payable, to which net profit will have to be applied. Last year the Firestone company wrote off approximately $16,000,000 in commitment losses and inventories.

The B. F. Goodrich Co. has restored its factory to the eight-hour shift basis, after operating ten-hour shifts, and has increased production over 25 per cent. This increase brings Goodrich tire production up to approximately 16,000 tires a day. The company is said to be working on several new types of tires to be offered in competition with new cord lines introduced by Goodyear and selling at considerably under the standard cord tire market lists. Goodrich officials, however, say no announcement of new tires will be forthcoming for some time.

Hudson-Essex Business Greatest in Closed Cars

DETROIT, May 23—Hudson Motor Car Co. reports closed car business since Jan. 1 to be 55 per cent of the entire output as compared to a total of 31 per cent in 1921. Essex Motors business is reported to be running at slightly more than 50 per cent in the closed car as against 19 per cent in 1921. Both companies declare that the proportion of this business is continuing at approximately the same rate even with warm weather at hand. Production totals for May when compiled are expected to show that the closed car percentage for that month is higher than the yearly average to date. Heavier proportion of closed car business is expected in the fall.

The new coach model, and the ability of both companies through volume sales to offer it at a slight increase over the open model prices, are accepted by officials as the principal reason for the rise in the closed car demand. The demand for closed vehicles has slowed down the general production capabilities of the two plants somewhat, owing to the greater time required to make closed bodies.

RAIL BUSES BOUGHT BY GREAT NORTHERN

ST. PAUL, May 22—As the first step in a determined effort to meet the competition of highway motor transport, the initial purchase of four rail motor buses by the Great Northern Railroad is announced by President Budd. One of the buses will be allotted to each of the four main divisions of the railroad, and they will be placed in operation within six weeks.

The Great Northern will operate two buses on Minnesota lines and the other two in Washington and in Montana. Manufacturers of rail cars will be placed in competition in the experiment to determine which will provide the most satisfactory and most economical service, as the railroad has ordered one Mack, one Service, one White and one Four Wheel Drive.

"The railroads must meet motor bus competition," said President Budd. "We will use the rail buses wherever they will afford the best opportunity."

Nash Adds Body Plant to Milwaukee Division

MILWAUKEE, May 22—A new body factory and general sheet metal working plant, costing $250,000, will be erected immediately by the Nash Motors Co. as a further extension of its Four Cylinder Car division at Milwaukee.

This extension was planned a little more than a year ago, but intermitted to await more favorable conditions in the industry. For some time past production of the Nash Four has been limited by the lack of finishing facilities, which will be provided by the new building and make it possible to manufacture approximately 100 per cent of the car under one roof. Between 55 and 60 Nash Fours are being turned out daily at present, which not only is below orders, but does not represent full capacity, due to the shortage of bodies, which makes it necessary to transfer cars for finishing.

The addition will be ready about Aug. 15 or Sept. 1, according to B. W. Twyman, general manager of the division.

Akron Employs Fewer Men for Big Output

Factories, Avoiding Transient Labor, Maintain Forces at Highest Efficiency

AKRON, OHIO, May 22—Although Akron's tire plants are producing 85 per cent of the old peak output of early 1920, they are gaining this output with scarcely more than 50 per cent of the total number of factory wage earners employed in the forepart of 1920.

The readjustment of the tire industry has brought about an average increase in individual and collective factory efficiency of 100 per cent. When Akron was turning out 100,000 tires a day, the nine major plants here were employing 72,000 factory wage earners, in addition to thousands of inspectors, foremen, factory office employees and business and general office employees. When the slump came, this number of producing workers in the factories dropped to 18,300 by December of 1920. It rose to 26,000 last July and then receded again.

Labor Turnover Reduced

To-day actual tire production in Akron is slightly over 85,000 casings a day. Yet the number of day wage earners in the factories does not exceed 43,000. In tube departments efficiency has increased several hundred per cent, as based on output. In rehiring men all Akron companies have avoided the transient element of labor, the "floater" and the "suit case chap" who all were responsible for a heavy labor turnover in peak times. They have re-employed only former employees who were the most efficient, showing a decided preference in favor of married men with families. This not only has brought about increased efficiency, but has materially reduced labor turnover.

And with these same companies following a hand-to-mouth policy by letting production fluctuate with current demand, only the most efficient of the tire builders are assured of permanent work. Efficiency checking systems have been established. When sales slump, production is cut and men are laid off, and it is the less efficient workers who are dropped from the payrolls, with the best workers kept. This practice in itself, say manufacturers, has tended to encourage a higher type of factory work and to keep efficiency at a maximum.

NO BRITISH TRUCK SHOW

LONDON, May 15 (*by mail*)—The Society of Motor Manufacturers, Commercial Vehicle Section, has definitely decided not to hold a truck show this year. Opportunity, however, will be afforded truck makers to exhibit models suitable for special purposes; for instance, at the Royal Agricultural Show—a national event—and at the Municipal Exhibition. But no chassis may be shown at such places, only complete vehicles.

Four Months' Output by Ford Is 281,066

Includes Cars and Trucks and Shows 55,850 Gain Over Last Year

DETROIT, May 24—Production in Ford American and foreign plants for the first four months of this year, excluding the Ford Canadian plant, is 281,066 cars and trucks, an increase of 55,850 over the same period last year. Demand in the United States and abroad is running a month ahead of former business, as indicated by the fact that April business of this year approximated that of May last year.

Total production of all plants for April was 111,944 cars and trucks, the output of the Ford Motor Co. of Canada being 5808 cars and trucks and the output of the company's foreign plants 5904. The Canadian plant showed an increased output over that of March of 600 cars and trucks. Detroit ranked first in assembly of all United States branches with a record of 11,155 cars and trucks; the Kearney, N. J., plant with 11,125 was second, and Philadelphia, Chicago and Buffalo ranked in that order.

Fordson Production, 15,906

At the River Rouge, 7445 tractors were built during April, a considerable increase over the April, 1921, total. The Cork, Ireland, tractor plant built 121 Fordsons. Total Fordson production up to the close of April was 15,906, which compared with 13,470 for the corresponding period in 1921. Production of tractors is expected to continue at the rate of 400 daily, this figure being reached in April.

Wood wheel production at the Hamilton, Ohio, plant of the Ford Motor Co. reached 200 sets daily early in April, and this schedule has been increased steadily so that by May 1 a schedule of 600 sets per 16 hours was reached. Facilities at the plant will be gradually extended until a capacity of 2000 sets daily is reached. The dry kilns at this plant were completed in May and complete conveyer systems installed so that all handling of material is done mechanically. New units will be added to the plant to meet the requirements of the increased production planned. All of the parts for the manufacture of the complete wheel will be built and assembled there.

In addition to the wheel construction, the Hamilton plant is building 7000 phaeton locks daily. Machinery for the manufacture of sedan and coupe door locks is being completed and will permit this plant to supply all of the locks for the closed cars.

FUEL RESEARCH COMMITTEE

NEW YORK, May 22—The following committee has been appointed to serve with Dr. Van H. Manning, director of research of the American Petroleum Institute, to take up various research problems with the aim of insuring adequate future fuel supply for motor vehicles: W. F. Faragher, chairman, Mellon Institute, Pittsburgh; R. E. Wilson, Massachusetts Institute of Technology, Cambridge; R. P. Anderson, United Natural Gas Co., Oil City, Pa.; N. A. C. Smith, Bureau of Mines, Pittsburgh; C. E. Waters, Bureau of Standards, Washington; R. R. Matthews, Roxana Petroleum Co., Wood River, Ill., and E. W. Dean, Standard Oil Co., 26 Broadway.

APRIL NOW ONLY 1,500 BEHIND MARCH, 1920

WASHINGTON, May 22—With reports still lacking from a few small companies, the automotive division of the Bureau of Foreign and Domestic Commerce announces that April production of passenger cars and trucks aggregated 218,456, which is only approximately 1500 less than the record for a single month, established in March, 1920.

Passenger car production totalled 196,512, an increase of nearly 30 per cent over March, while truck production was 21,941 compared with 19,449 for the same companies in the preceding month. The following table gives the production for identical companies for the past four months.

	Passenger Cars	Trucks
January	81,638	9,204
February	109,039	12,968
March	152,647	19,449
April	196,512	21,944

Times Square Auto Will Be Reorganized

NEW YORK, May 24—The Times Square Auto Supply Co. has been incorporated in Delaware with a capital of $3,400,000 to acquire the assets of the Consolidated Distributors, Inc., which has been in receivership since September last. The incorporation is in accordance with the reorganization plan which has been accepted by creditors.

The Consolidated Distributors was incorporated in this state in September, 1916, as the Times Square Auto Supply Co. and operated under that name until March, 1921. It was engaged in the wholesale and retail distribution of automobile accessories, but when the name was changed its wholesale business was separated from the retail. Consolidated Distributors had a capital of 300,000 shares of no par value common of which 190,396 shares are outstanding. An issue of 7 per cent cumulative preferred stock was redeemed in July, 1920.

It is understood that the policies which were successful until the depression in business became pronounced will be continued to a large extent by the reorganized company, which has its offices at Broadway and Fifty-sixth Street. The company has stores in fourteen cities.

Overland Companies Elect Wilson as Head

Willy-Morrow and Wilson Foundry Hold Elections—Plants Speeding Up

TOLEDO, May 24—Increased activity in the subsidiary plants of the Willys-Overland Co. at Elmira, N. Y., and Pontiac, Mich., as well as at the main plant in Toledo indicates an effort to bring production up to the sales and the demands of dealers.

Annual meetings of both subsidiaries resulted in the election of C. B. Wilson, vice-president and general manager of the Willys-Overland Co., as president of the Willys-Morrow Co. at Elmira and of the Wilson Foundry & Machine Co. at Pontiac.

C. E. Killinger was elected vice-president and general manager of the Willys-Morrow Co.; George R. Spencer is secretary, and H. C. Hobler treasurer. Directors are H. L. Thompson, W. L. Milner, G. M. Mather, George M. Jones, L. A. Miller, all of Toledo, and Wilson and Killinger.

D. R. Wilson of Pontiac was chosen vice-president and general manager of the Wilson Foundry & Machine Co.; C. E. Killinger, treasurer, and E. W. MacKenzie, secretary. Directors are H. L. Thompson, W. L. Milner, G. M. Mather, George M. Jones, and the two Wilsons.

The Willys-Overland Co., here, reports that unfilled orders now on the books are equal in amount to those at the busiest period in the plant's history. Sales continue good.

Production is considerably more than 400 cars daily, and nearly 8500 men are employed.

Advertising Managers to Discuss Problems

NEW YORK, May 23—A tentative program has been prepared for the meeting of advertising managers representing members of the National Automobile Chamber of Commerce, which will be held at the University Club in Chicago, June 13. Edward L. Jordan, chairman of the advertising committee, will preside. Among the topics which will be taken up will be:

"Relationship of the advertising department to the dealer," with discussion led by A. B. Batterson of the Buick Motor Co.

"Special problems in motor truck advertising," with discussion led by L. B. Dudley of the Federal Motor Truck Co.

"The next big selling punch," with discussion led by Jordan.

"Selling cars to women," with discussion led by Elizabeth Hallam Bohn.

"Advertising used cars," with discussion led by G. V. Radoye of the Haynes Automobile Co.

"What automotive happenings are news," with discussion led by W. A. Birmingham of the Chicago Evening Post.

"The place of pictures in advertising," with discussion led by W. K. Towers of the Page-Detroit Motor Car Co.

Seating Delegates Causes A. A. A. Split

Five States Bolt at Annual Convention and Will Form New Organization

ST. LOUIS, May 23—Seating of the seventy-two delegates of the Chicago Motor Club at the annual meeting of the American Automobile Association, held here, resulted in a split in the organization led by the Ohio, Illinois and Indiana state associations. Kentucky and Texas followed.

The insurgents have named a general committee which will formulate plans for a new association which probably will be called the National Motor League. It is proposed to call a convention in June at a city not yet designated. The leaders of the bolting delegations are Judge Walter D. Meals and Fred H. Caley of Cleveland, and Richard Lee of Chicago. Meals was a candidate for president of the A. A. A. The insurgents claim to represent 243,000 members.

Diehl Re-elected President

After the bolt, the remaining delegates re-elected George C. Diehl of Buffalo as president. The other officers chosen were Arthur Fifort of Hartford, Conn., as secretary, and H. A. Bonnell as treasurer. The executive board, which is composed of fifty-six representatives of all sections of the country, soon will select a new executive secretary to take the place of the late A. G. Batchelder.

The insurgents base their radical step on the contention that the Chicago Motor Club, which is headed by Charles M. Hayes, has invaded the territory of other clubs and that it is not legally a member of the A. A. A. It also is alleged that the Chicago club is selling insurance and other service not provided for in the constitution to its members and to members in the territory of other clubs. Hayes is in the insurance business himself and the bolters contend he is using his strong influence in the A. A. A. to commercialize the organization.

Hayes Makes Denial

This is vigorously denied by Hayes, who is chairman of the membership committee and a member of the executive committee of the A. A. A. He asserts that there is no basis for the charge that he receives commissions from garages along the routes mapped out by the Chicago club. He says that the plan of the Chicago club of giving service to motorists in addition to the legislative aid provided for by the constitution has been approved by the executive committee of the A. A. A. and does not violate its constitution.

The Chicago club recently withdrew from the Illinois State Association after differences over the activities of the Chicago organization. The insurgents contended this removed the Chicago club from the A. A. A. as the Illinois State Association holds the Illinois franchise, and that clubs can enter the national association only through the state organization. This contention was not supported by a majority of the delegates, and the bolt followed.

Caley Elected in Ohio

CLEVELAND, May 20—Fred H. Caley has been elected president of the Ohio State Automobile Association. He has been secretary of the organization, working for its interests simultaneously with those of the Cleveland Automobile Club and the Cleveland Automobile Dealers Association, of which he has been secretary. Caley has divorced himself from trade interests and will give his entire attention from now on to owner interests in Ohio.

At the meeting of the association resolutions were adopted to wage a determined fight against automobile stealing and to oppose any further legislative efforts to saddle unjust burdens on motorists in the form of special taxes.

M. A. M. A. Members Report Further Sales Increase

NEW YORK, May 25—Another sharp increase in sales by members of the Motor and Accessory Manufacturers Association was recorded in April. The total was $33,830,000 as compared with $28,670,000 in March, $22,720,000 in February and $17,330,000 in January. The increase for April over March was about 18 per cent. The total of past due accounts showed an increase of about 2 per cent in April, bringing the total to approximately $3,000,000. There was a decline of 1½ per cent in the total of notes outstanding, bringing the figure to about $2,500,000.

Commonwealth Receiver Disposes of Contracts

CHICAGO, May 22—A receiver has been appointed for the Commonwealth Motor Co. by the Federal Court here upon application of a number of creditors, whose claims aggregate $35,000. The company was organized a few years ago to manufacture the Commonwealth car, which later was discontinued. Recently the company has been manufacturing taxicabs at its plant at Rockdale, near Chicago.

The material on hand and the contracts of the bankrupt company have been sold by the receiver, Edwin D. Buell, to the Checker Manufacturing Co.

N. A. C. C. MEETING JUNE 7

NEW YORK, May 23—The annual meeting of the National Automobile Chamber of Commerce to elect successors to the directors whose terms have expired will be held at headquarters in this city June 7. The directors whose places will be filled are H. H. Rice, J. Walter Drake, C. C. Hanch, John N. Willys and Roy D. Chapin. It is probable that they will be re-elected. In addition to the election there will be a general discussion of what is in prospect for the industry for remainder of year.

Racine Tire Claims to Be Paid in Full

Creditors Will Receive Stock in Holding Branch of New Company

RACINE, WIS., May 24—Reorganization of the defunct Racine Auto Tire Co. is being effected through the incorporation of a new concern known as the Racine Horseshoe Tire Co. under the laws of Wisconsin by O. W. Johnson, M. F. Eldred and F. K. Camp. The capitalization consists of 1000 shares without par value.

The plan of reorganization calls for the formation of two new concerns, one a holding company and the other an operating company. The former will hold the entire capital stock of the operating company, which is acquiring practically the entire property of the defunct corporation.

The liabilities of the Racine Auto Tire Co., as indicated in a statement issued by the creditors' committee, amount to $1,547,552. Creditors will receive 100 per cent on claims, payable 60 per cent in gold notes and 40 per cent in first preferred shares in the holding company, which will issue serial 6 per cent gold collateral trust notes in the sum of $1,200,000. Until 50 per cent of these notes have been retired no dividends will be paid upon the common stock of the holding company.

Start with Few Obligations

The operating company will commence business with practically no indebtedness or obligations of any kind save first mortgage bonds amounting to $300,000. The balance sheet of this corporation will show assets of $1,160,913, with plant and real estate worth $970,401 additional, giving total resources of $2,131,314.

All of the stock of the holding company is placed in a voting trust consisting of O. W. Johnson, H. J. Haigh, W. L. Lyall and H. H. Whitman, who represent the principal creditors of the defunct concern.

Court Sustains Bakelite in Suit for Infringement

CHICAGO, May 22—The Redmanol Chemical Products Co. has made a settlement of the action brought by the General Bakelite Co. against the General Insulate Co. for infringement in the use of Redmanol. Although the action was brought against a customer it was defended by the Redmanol company.

Judge Chatfield handed down a decision sustaining the Bakelite patents covering the combination of phenol condensation products with fiber and fibrous materials, as well as the simultaneous use of heat and pressure in the manufacture of articles made from these products. The Redmanol company has now consented to a decree and paid heavy damages in liquidation. It will manufacture henceforth under a license.

40,000 Units Built by G. M. C. in April

Rapid Rate of Production of Cars and Trucks Makes Deep Cut in Inventory

NEW YORK, May 22—The automobile and truck divisions of the General Motors Corp. produced and sold approximately 40,000 units in April. This total undoubtedly will be exceeded in May. General Motors plants in the United States and Canada produced approximately 115,000 motor vehicles in the first four months of 1922. This more than doubles the production for the same period last year.

Chevrolet heads the production list and is now making cars at the rate of 1000 a day. It is reported that even with its new plant operating at capacity, Cadillac is unable to meet the demand for cars. Buick is operating at 65 per cent more than last year and is expected to reach a new high mark in May.

Earnings of the corporation for the first quarter of this year were in excess of $8,000,000. It is expected the second quarter will show earnings of at least $18,000,000. This indicates that the corporation is rapidly approaching the earning basis established in its most prosperous period.

At the present rate the common stock will show substantial earnings for the year. The present rapid rate of production has made a deep cut in the inventory which has resulted in a 50 per cent reduction in the floating debt since the first of the year, and it is expected the remainder will be wiped out in two or three months.

Industry Gets No Place on U. S. Chamber Board

WASHINGTON, May 22—The automotive industry failed in its efforts to elect C. E. Kettering, W. O. Rutherford and J. Walker Drake to the directorate of the United States Chamber of Commerce at the annual convention here last week. The reason was that there were too many candidates from the sixth district, in which all of them reside.

The National Automobile Chamber of Commerce failed also to have the Chamber adopt specific resolutions protesting against the reimportation of motor vehicles sold by the Government in foreign countries, advocating the repeal of war excise taxes and an endorsement of Federal aid in highway construction. The position taken in refusing to adopt the resolutions specifically was that the Chamber already had gone on record in favor of them in the broadest sense and nothing was to be gained by reiterating its attitude.

WINS SUIT AGAINST G. M. C.

BOSTON, May 22—A jury in Federal district court has awarded Rollin Abell of Milton, a mechanical engineer, a verdict of $154,816 in his suit against the General Motors Corp. for breach of contract. According to Abell's attorney, the engineer entered into a contract with the corporation under which it was agreed that General Motors should take a patent applying to the cylinder valves of automobile engines and pay Abell a minimum of $50,000 a year for three years if they took a contract with the non-exclusive license for the use of the patent. The corporation argued that it had not agreed to contract for the license.

Detroit Air Cooled Car to Be Begun in 90 Days

DETROIT, May 23—Production of the Detroit air cooled car will be started in 90 days, according to a statement by W. J. Doughty, president of the Detroit Air Cooled Car Co. Bids for material and parts are being sought in 1000 lot quantities. Jigs and patterns for the car are complete, Doughty said, so that the company is prepared to get into immediate production. Men identified with the Doughty organization are:

G. R. Tremolada, designer of the twin-three engine; C. H. Bennett, president and general manager of the Daisy Air Rifle Co.; August Gieseler, superintendent of the National Tool Co., Cleveland; John McArthur, coach and automobile body builder, Detroit; Frank Sanders, former Franklin distributor, Chicago; George Gagnier, Detroit, and Earl B. Newton, secretary-treasurer Mansfield Steel Corp. and treasurer of the King Trailer Co., Detroit. L. M. Bradley has been named advertising manager.

A factory site will be selected in Detroit within a short time, Doughty said. A phaeton, coupe and sedan will be built at the start. The list price on the phaeton has been fixed tentatively at $1,280 and the prices on the closed models will be fixed later.

Financing Companies Prepare for Meeting

NEW YORK, May 22—Arrangements have been completed for a meeting of the National Association of Automobile Financing Companies at Indianapolis on June 7 which is one of the days set for the convention of the National Association of Credit Men. The constitution and by-laws of the financing association will be offered for approval at the meeting, the business session of which will be held at the Columbia Club. There will be a banquet at the Claypool Hotel in the evening at which the speakers will be Hon. Charles A. Bookwalter, Walter E. Heller, Henry Warrum, Fred A. Weber, Jr., and C. C. Stratton.

Members who attend the meeting will be able to avail themselves of the special railroad rates offered for the convention of the National Association of Credit Men.

The arrangements for the meeting have been made by the Indianapolis branch of the National Association. Various problems of vital importance will be considered.

Lee to Meet Trade in Next Two Months

Trip Planned Will Take Him from Coast to Coast Delivering Addresses

WASHINGTON, May 24—In order that the automotive division of the Department of Commerce may place its finger on the pulse of the American automotive trade, thus enabling it to function for the benefit of the trade, a series of addresses has been arranged by Gordon Lee, chief of the division.

The ultimate object of Lee's trip, which will occupy two months, taking him across the continent and enabling him to speak before practically all the larger automotive organizations of the West, is to sell more automobiles.

"The automotive division of the department may be considered by the automobile industry as its selling agent, wherever and whenever a market can be developed," Lee said, "and I am making this trip for the purpose of explaining first hand to the industry the equipment of the department to help them in their problems and to find out how we can best serve the automobile industry."

Begins at New York

The itinerary up to and including Aug. 10 is as follows:

June 12 and 13, New York, before the N. A. C. C.; June 14, 15 and 16, Rochester, Chamber of Commerce; June 19, Des Moines, joint meeting, automobile club and chamber of commerce; June 20 to 24, Colorado Springs, annual meeting of the Automotive Equipment Association; June 27, Denver, Denver Civic and Commercial Association;

July 6, San Diego, joint meeting, dealers association, chamber of commerce and automobile club; July 7, Los Angeles, automotive trades association; July 8, 9 and 10, Yosemite Valley, joint meeting of the San Joaquin Automotive Trades Association and the Sacramento Dealers Association; July 11, Oakland, California Automotive Trade Association; July 12, San Francisco, California Automotive Trade Association;

July 14, 15 and 16, Medford, joint meeting, Southern Oregon Automotive Trades Association, Roseburg, Grants Pass, Ashland and Medford participating; Salem, joint meeting, Willamette Valley Automotive Trades Association and the Cherrians; July 18, Portland, Automobile Dealers Association; July 19 and 20, Portland, joint meeting, Portland Ad Club and Womens Advertising Club;

July 21, 22 and 23, Olympia, state convention, Washington Automotive Trades Association; July 24, Seattle, automobile dealers association; July 25, Tacoma, joint meeting, dealers association and chamber of commerce; July 26, Seattle, Rotary Club; July 28, Seattle, members council, chamber of commerce; July 29, Spokane, joint meeting of the dealers association, Inland Automobile Association and chamber of commerce;

Aug. 2, Butte, joint meeting, dealers association and Rotary Club; Aug. 4, Bois, dealers association and Rotary Club; Aug. 7, Salt Lake City, Intermountain Automotive Trades Association; Aug. 10, Sheridan, Wyo., joint meeting, Custer Battlefield Hiway Association and chamber of commerce.

Men of the Industry and What They Are Doing

Van Sicklen Made General Manager

N. H. Van Sicklen, who has had an intimate and influential connection with motor cars since the day the first "horseless vehicle" came down an American highway, has been appointed general manager of Apperson Brothers Automobile Co. at Kokomo, Ind.

Van Sicklen's interest in wheels goes far back beyond the advent of the automobile. He rode his first high-wheel bicycle in 1878; in 1882 he won his first race and for the next nine years was an important contender in the series of track and road races that swept the country, getting more than his share of cups, medals and purses.

Aside from these activities he established a printing business and in 1890 began publishing *The Bearings*, a journal of the bicycle trade, which in 1898 was consolidated with two other papers and became the *Cycle Age*. After he sold this paper he became a farmer, but returned to the industry in February, 1901, as an American Steel and Wire representative.

He left this work upon buying *Motor Age* from Samuel A. Miles, and when he sold it in January, 1908, after being identified with it for four years, became branch manager at Chicago for the Knox Automobile Co., helped develop the Automobile Blue Books, an interest he later disposed of, and then took charge of the F. A. L. Motor Car Co., of which he continued the head until the business was sold. Van Sicklen helped organize the Chicago Motor Club and the Chicago Automobile Association, and served as president of both bodies.

In February, 1913, he began to build the Van Sicklen speedometer, which subsequently was sold to John N. Willys and by him to Stewart-Warner. During the war he and his organization were largely occupied with the development and manufacture of special instruments for the aviation departments of the Army and Navy. Early in March of this year he was appointed assistant general manager of the Apperson organization.

Stutz Appoints Crawford

Charles F. Crawford, who for many years has been identified with the Cole Motor Car Co. as chief engineer, has been appointed chief engineer of the Stutz Motor Car Co. of America. He was chief engineer of the Cole concern for seven years and later became chief engineer and vice-president of the Premier Motor Corp. Later he conducted a consulting engineering business and not long ago went back to Cole as chief engineer. His successor at the Cole has not yet been announced.

C. B. Phelps, Jr., Goes to England

C. B. Phelps, Jr., has been appointed as assistant to the managing director of Dodge Brothers, Ltd., which was organized recently to handle Dodge Brothers business in the British Isles. He has been with the Dodge company since 1916 with the exception of two years in the Navy, and has had extensive experience in both foreign and domestic merchandising. He has sailed for London with Joseph H. Willson, the managing director.

Jackson, Mott's Assistant

J. B. Jackson, formerly with the E. I. du Pont de Nemours & Co. of Wilmington, Del., and more recently connected with the Buick Motor Co. at Flint, has become identified with the central office of General Motors Corp. as a personal assistant to C. S. Mott, vice-president and chief of the advisory staff.

Robinson With Campbell-Ewald

Loren T. Robinson, who has been assistant advertising manager of the General Motors Truck Co., has resigned and joined the Campbell-Ewald advertising agency in Detroit. Robinson is a former Detroit newspaper man. While with General Motors he had charge of its publication *Truck Talk* and a periodical for sales agencies. His place will not be filled immediately, according to Advertising Manager Baird, who says that for the present the duties will be divided among the staff.

R. M. Cowhan Promoted

R. M. Cowhan has been appointed export sales manager for Earl Motors, Inc., succeeding Clarence Thurston, who died some time ago. He was formerly an assistant sales manager at the factory and will continue the export headquarters there. Business in this department has been showing a steady improvement, and the company will designate a part of its output for export business.

Stratton Resigns as Sales Manager

Frank S. Stratton, who has resigned as general sales manager of the Grant Motor Car Corp. after an association covering a year and a half, was previously passenger car sales manager for the Packard Motor Car Co. He has been identified with the industry since 1912. He has made no announcement of his plans.

Rugg Joins Dodge Brothers

Harry M. Rugg who for the past year has been director of educational expansion of the Michigan State Automobile School, Detroit, has been made assistant experimental engineer for Dodge Brothers.

New British Aviation Director

Major-General Sir W. S. Brancker, K.C.B., A.F.C., has been appointed director of civil aviation in the air ministry of Great Britain.

Garlent Now Works Manager

J. E. Garlent has been appointed works manager of the Auto Wheel and Gier Pressed Steel plants of the Motor Wheel Corp. of Lansing. Garlent assumes charge of operations in both divisions after considerable experience as works manager of each separately. It was decided to combine the works management of both under one head for greater efficiency in the operation of these two large units of the corporation. Before joining Motor Wheel, Garlent was factory manager for Hupmobile and factory manager of the King plant.

A. E. Hoffman Given Dinner

A. E. Hoffman, director of the Clydesdale Motor Truck Co., Clyde, Ohio, was a guest at a dinner in the Hotel Martinique, New York, given by several directors and the entire staff of employees of the Clinton Truck Sales Co., New York, of which he is president. Talks on highway transport and improved conditions in the motor truck industry were made by A. J. Banta, general manager of the Clydesdale corporation; J. H. Baynen, secretary, and R. Miller, treasurer of the Clinton Sales Co., J. V. Boise and A. B. Neiber of the Chatham and Phoenix National Bank.

Griffin Changes Companies

H. B. Griffin has resigned as vice-president of the Doehler Die-Casting Co., Brooklyn. He is well known throughout the automotive industry, having been connected with the Doehler company for the last fifteen years. Griffith is now associated with the Light Manufacturing & Foundry Co., in charge of the sales of the company's die casting division.

Hart-Parr Advances Bloom

L. H. Bloom, assistant sales manager of the Hart-Parr Co., Charles City, Iowa, has been promoted to general sales manager. He has been identified with the Hart-Parr organization for the last six years.

Neale Is Lines Successor

A. W. Lines has resigned as sales manager of the Spencer Smith Machine Co., Howell, Mich., effective June 1. He was formerly sales manager of the Detroit Twist Drill Co. and the Parker Rust Proof Co. His plans for the future have not been announced. He is succeeded by J. E. Neale, formerly of Chicago.

R. W. Chalmers in District Work

R. W. Chalmers has been appointed district sales manager in the Eastern territory for the Windsor gravity dump body and the Trail-Ford for the Automotive Utilities Corp. of Detroit. He was formerly associated with tractor and trailer business in a retail capacity.

Men of the Industry and What They Are Doing

McCormick Visits Springfield

Cyrus H. McCormick, works manager of the motor truck division of The International Harvester Co., visited the Springfield works a few days ago and conferred with Superintendent C. H. Smart regarding production. McCormick has just returned from a business trip abroad during which he visited France, Germany and England. It is expected that orders for foreign shipments will soon be placed with the Springfield plant as a result of his trip overseas. Owing to the receipt of material, the Springfield works is again able to keep up to its schedule of fifty high speed motor trucks a day. Orders from municipalities and large business concerns are being received at the local plant.

A. B. C. Hardy Dined

A dinner was given by the factory organization of the Olds Motor Works at Lansing in honor of the first anniversary of A. B. C. Hardy, president and general manager, as chief executive of the company. Hardy was presented with a silver testimonial in appreciation of his leadership.

Civic Work for Belnap

L. J. Belnap, president of Rolls-Royce of America, Inc., has been named as aeronautical commissioner for the city of Springfield, Mass.

McGonigal Heads Cletrac in Canada

S. A. McGonigal has been elected president and managing director of the Cleveland Tractor Co. of Canada, Ltd., succeeding J. L. Hibbard, resigned. McGonigal's connection with the Cleveland company includes four years of intensive work both at the company's home office and in the field. He has been assistant to the vice-president in charge of sales and manager of the company's Atlanta office as well as sales manager of the central district comprising Michigan, Indiana, Kentucky and Western Ohio. The Cleveland Tractor Co. of Canada, Ltd., is located at Windsor, Ont., with branch organizations at Montreal and Winnipeg and distributors at the important agricultural and industrial centers.

Loudon Made Resident Engineer

W. P. Loudon, formerly of Pittsburgh, has been appointed resident engineer of the automotive equipment department of the Springfield, Mass., plant of the Westinghouse Electric & Manufacturing Co.

Scrimshaw on College Faculty

Stewart Scrimshaw, manager of industrial relations of the Kearney & Trecker Corp., Milwaukee, manufacturer of milling machines and other machine tools, has been appointed to the faculty of the college of engineering of Marquette University, Milwaukee. He left May 19 for a tour of Europe to study educational and industrial problems and will assume his new duties at the university on Sept. 1.

Buell Directs Fender Sales

C. D. Buell is now sales manager of the Michigan Crown Fender Co. of Ypsilanti.

Walsh Advertises Motor List

Robert T. Walsh has been appointed advertising manager of the Motor List Co., and Arthur Livingston, quota statistician. Walsh was at one time assistant advertising manager of the Ford Motor Co. and later served as advertising manager of Maxwell, King and Briscoe. New officers of Motor List Co. recently elected are R. L. Polk, Detroit, president; Martin Tuttle, Des Moines, vice-president; Ward Gavett, Detroit, secretary, and R. L. Polk, Jr., Detroit, treasurer.

Englebeck Goes With Peerless

C. A. Englebeck, who has been prominently connected with the marketing of automobiles in Chicago since the early days of the industry, has been appointed general manager of the direct factory branch which the Peerless Motor Car Co. has opened in Chicago. He has resigned as sales manager of the Chicago branch of the Cadillac Motor Car Co. to renew his affiliation with R. H. Collins, Peerless president, with whom he was associated while Collins was at the head of the Cadillac company.

Dearing Succeeds Whipple

R. M. Dearing has been appointed Denver branch manager of the Bearings Service Co., succeeding H. C. Whipple, who has resigned. Previous to the Denver appointment, Dearing was assistant branch manager of the Chicago headquarters.

Frederickson Joins Clark

W. S. Frederickson has resigned as general sales manager of the Hart-Parr Co. to join W. W. Clark, former export manager of the company, in a wholesale importing business with headquarters in Charles City, Ia.

O. E. Utz with Fedders

O. E. Utz, who has become sales manager of the Canadian plant for the Fedders Manufacturing Co., Buffalo, served as purchasing agent for the Pierce-Arrow Motor Car Co. for twenty years.

Gibbons Is District Sales Head

Frank Gibbons has been appointed district sales manager of the Cleveland district for the Central Steel Co. of Massillon, Ohio, with headquarters in the Swetland Building, Cleveland. He goes into the Cleveland district from the general offices of the company where he has been connected with the sales department for a number of years. He will handle sales on the entire line of Central Steel products.

Kimball, Territorial Manager

A. D. Kimball has been made manager of the Detroit territory for the Wheeler-Schebler Carburetor Co., Indianapolis, and will be in charge of factory sales in Michigan. Kimball is well known in automotive circles through his connection with the Ball & Ball Carburetor Co. Previous to that association he served as engineer for the Fulton Truck Co.

Shea Sales Head for Amazon

William J. Shea, formerly central district manager of the Portage Rubber Co., has been appointed sales manager of the Amazon Rubber Co. According to Shea, production at the Amazon plant will be more than doubled during the present month.

Howard Leaves Chandler

J. M. Howard, for more than six years advertising manager of the Chandler Motor Car Co., has resigned, but has made no announcement as to his future plans. Howard came here from Washington and formerly was a newspaper man in Virginia. His successor has not been appointed.

Ford Takes Branch Head to Manage His Railroad

INDIANAPOLIS, May 24—Fred L. Rockelman, for the last three years general manager of the Indianapolis branch of the Ford Motor Co., has been appointed general manager of the D., T. & I. Railroad Co. and will take charge of the line at once, with headquarters in Detroit.

Rockelman is 37 years old but has been identified with the Ford organization for many years. He was among the first twenty-five employees of the Ford Motor Co., entering the work as an inspector. Later he advanced to positions in factory management, and developed into the sales end. For a time he was engaged in Ford agency work in Buffalo and Seattle. While in Seattle he was appointed general manager of the Indianapolis branch.

CANADIAN IMPORTS

MONTREAL, QUE., May 24—From 1918 to 1922 inclusive a total of 46,484 passenger automobiles, valued at $45,749,115, were brought into Canada, paying a duty of $15,960,121. In the same years 7494 motor trucks were imported, valued at $12,497,714 and paying a total duty of $4,253,438. Automobile parts imported during the period mentioned were valued at $47,979,170, and these paid duty to the amount of $14,808,359.

Seiberling Lowers Prices 12½ Per Cent

Company Will Also Absorb Government Excise Tax Collected from Consumer

AKRON, May 24—Frank A. Seiberling announces that a straight 12½ per cent price cut will be made on all sizes of Seiberling and Portage straight side cord tires, effective June 1. This will bring the price of the 30 x 3½ Seiberling clincher down to $10. Another feature of the price reduction is that the Seiberling company will absorb the 5 per cent Government excise tax which the dealer heretofore has collected from the consumer in addition to the regular retail price.

It is stated that Seiberling has put into effect in his two plants advanced methods of manufacture which have brought production costs down to a minimum. It is claimed that the New Castle plant is one of the most efficient manufacturing units in the world. Another factor in the price reduction is Seiberling's view of the future cotton and rubber markets. Seiberling believes that the day of the cord tire has arrived and he has confined the Seiberling brand to that type.

Price of Fabric Casings Reduced by Michelin Tire

MILLTOWN, N. J., May 22—The Michelin Tire Co. announces substantial reductions in its fabric casings. Some of the cuts are:

SOFT BEAD CLINCHER TYPE

Size	Old Price	New Price
30 x 3	$12.90	$10.90
30 x 3½	14.90	12.75

STRAIGHT SIDE TYPE

Size	Old Price	New Price
32 x 4	$26.90	$23.25
33 x 4	27.90	23.80
34 x 4	28.90	24.90

Case Reduces Prices and Expands Its Line

RACINE, May 22—The Case Threshing Machine Co. announces reductions on both its open and closed types of Model X. The 5-passenger phaeton formerly quoted at $1,890 is now priced at $1,790, and the sedan formerly listed at $2,790 now sells for $2,690. A roadster priced at $1,750 and a brougham at $2,550, this model, are now being brought out.

The company has replaced its Model V with a new model to be known as W. The 7-passenger phaeton is priced at $2,250, the 5-passenger or sport roadster at $2,200, the coupe at $2,850 and the 7-passenger sedan at $3,250.

GARY'S PRICES HIGHER

GARY, IND., May 19—The Gary Motor Corp. has increased the price of all models of its trucks, with the exception of model F 1½-ton, which remains at $1,675. The new and old prices are as follows:

	Old Price	New Price
Model I 2-ton	$2,150	$2,250
Model J 2½-ton	2,550	2,650
Model K 3½-ton	3,550	3,650
Model M 5-ton	4,000	4,100

Earl Increases Price on Three Models $100

DETROIT, May 20—Prices on Earl cars in three models have been increased $100, the phaeton now being listed at $1,095 and the sedan and brougham at $1,795. The price of $1,485 on the special roadster remains as formerly. In April Earl prices were reduced from $1,185 in the phaeton and $1,895 in the closed models.

The company notes that orders have grown larger steadily despite the increase, which is ascribed to higher cost of manufacturing, notwithstanding the volume production which has now been reached.

CHEVROLET COUPE REDUCED

DETROIT, May 22—The Chevrolet Motor Co. has announced a reduction in the price of its "490" coupe from $875 to $850.

MINNEAPOLIS TRACTORS LOWER

HOPKINS, MINN., May 22—The Minneapolis Threshing Machine Co. has reduced the prices of its farm tractors. The list follows:

	Old Price	New Price
12-25-hp.	$900	$800
17-30-hp.	1,675	1,600
22-44-hp.	3,000	2,650
35-70-hp.	4,150	3,850

Lincoln Motors Building New Touring Car Deluxe

DETROIT, May 23—Lincoln Motor Co. will make first shipments in June of a new deluxe 7-passenger touring car, the price of which has been fixed at $3,800. The new model is a companion to the phaeton and roadster deluxe on which the company has been in production since last summer and the prices on which are also $3,800. This line is independent of the regular production model, the price on which remains at $3,300, as fixed immediately after the sale to the Ford interests.

Production at Lincoln is now approximately thirty cars daily, dependent on the receipt of materials and bodies, the latter being still a heavy drawback to a steady flow of cars. Lincoln is served by a number of body makers, according to model, but because of the semi-custom nature of the work, it is difficult to get deliveries in the quantity required.

Henry Ford is spending much of his time at the Lincoln factory consulting with the Lelands, in whose hands the active management remains. Changes in the layout and arrangement of factory equipment are continuing, and some new equipment is being added with an eye to facilitating output.

New Rail Rates Aid Makers and Buyers

Interstate Commerce Commission Orders 10 Per Cent Reduction in Freight Cost

NEW YORK, May 25—The horizontal reduction in freight rates ordered by the Interstate Commerce Commission, averaging 10 per cent, will result in material savings not only to the automotive industry but to purchasers of motor vehicles. It has been estimated that the freight bill for a normal year on shipments of finished passenger cars and trucks approximates $100,000,000. A 10 per cent reduction will mean a saving of about $10,000,000, or an average of about $5 on an annual production of 2,000,000 vehicles.

No statistics have been compiled showing how much freight is paid in a year by the various branches of the automotive industry on the shipment of supplies and raw materials, but it is believed it would amount to another $100,000,000.

Inasmuch as purchasers of cars and trucks now have the freight from the factory added to the price of the vehicle, they will profit directly by the reduction in rates.

The reduction will make a saving of from $15 to $30 a car, according to weight, on shipments from Detroit to the Pacific Coast, and of from $5 to $10 a car on shipments from the Detroit territory to New York.

It is believed the railroads will accept the reduction ordered, and they are asked to inform the Interstate Commerce Commission not later than May 31 whether the findings will be carried into effect without formal order by the commission.

For all practical purposes the new rates are those in effect Aug. 25, 1920, prior to the granting of an increase at that time by the I. C. C.

The decision of the commission that rates should be reduced was unanimous, although some of the commissioners expressed the belief that a reduction of 10 per cent would have no positive influence in lowering the cost of living, stimulating industry or ameliorating economic conditions.

EXPORT LUNCHEONS RESUMED

NEW YORK, May 24—The monthly luncheons of the New York export representatives of the National Automobile Chamber of Commerce will be resumed here on June 29, the last Thursday in the month. George F. Bauer, secretary of the N. A. C. C. foreign trade committee, in announcing their resumption today, said that the meetings would be opened to all automotive export officials and invitations will be sent to members of the Motor and Accessory Manufacturers' Association, the Rubber Association of America and other allied organizations.

Uniformity in Colors of Lights Endorsed

American Engineering Standards Committee Starts Movement for Standardization

NEW YORK, May 23—A movement for standardized colors for traffic signals for highways, buildings, etc., was started to-day by the American Engineering Standards Committee, which called a meeting attended by delegates of more than fifty associations interested in such work. The meeting went on record as favoring a program of national uniformity in colors of lights used as signals by night and non-luminous colors used as day signals.

The plan is not only to standardize colors for day and night, but the position of different colored lights when used for signal purposes.

The meeting was represented by practically all associations connected with the automotive industry, as well as associations representing railroads, trolley companies, safety engineers, electrical engineers, Bureau of Standards, Bureau of Public Roads and many other organizations. An international character was added by the presence of the Canadian Engineering Standards Associations.

General Recommendations Adopted

No definite action was taken at to-day's meeting beyond adopting a series of general recommendations to outline the scope of the work. A sectional committee of the American Engineering Standards Committee, composed of delegates from all interested organizations, is to be appointed to carry out the details of the work.

The recommendations accepted at to-day's meeting were as follows, the delegates first going on record as favoring national uniformity in the use of colors for traffic signals:

1—The use of colored lights on all vehicles using the highways.

2—Their use on signals along highways and its curbs, both for permanent and temporary purposes.

3—Their use for highway crossings for steam and electric railways.

4—A co-ordinated relation of color, position, form and number of signals.

5—A co-ordinated relation to systems of flashing, or similar signals.

6—Colors for non-luminous signals.

7—Recommendations on the use of colors for emergency signals.

8—Methods of specifying or defining colors for other signal purposes.

9—Any other uses for which color should be employed as signals.

Change to Yellow Opposed

It was planned by chairmen who had drafted the agenda that the question of signals for steam railroads and electric railroads would be considered in connection with those for highways, but strong opposition was brought forth by the railroad and trolley interests with the result that recommendation No. 3 was eliminated from consideration, except where highways cross steam or trolley lines.

The question of railroads favoring the elimination of the red tail light from the automobile was suggested and met with opposition. Railroad interests were not looked upon favorably as wanting to keep entirely out of this research on railroad signals and yet attempting to dictate the lights that highway vehicles should carry. This matter will have to be carried to a solution in the sectional committee.

The necessity for an international standardization of color for traffic signals was suggested and this will doubtless be considered by the sectional committee.

Some delegates went so far as to recommend that in an investigation of this character the possibility of standardizing in all forms of transportation, namely, marine, air, railways, trolleys, highways, etc., should be broadly considered.

3,700 PASSENGER CARS PRODUCED IN 1899; TOTAL OF 1,514,000 WERE BUILT LAST YEAR

NEW YORK, May 22—Interesting statistics with reference to the automotive industry are contained in the 1922 issue of Facts and Figures, the annual year book of the National Automobile Chamber of Commerce, which is now on press. In view of the fact that if passenger car production continues at anything like the present rate, a new record will be established in 1922, the following table showing passenger car production and wholesale value since 1899 is valuable:

Year	Number	Wholesale Value	Year	Number	Wholesale Value
1899	3,700	$4,750,000	1915	818,618	$565,978,950
1904	21,281	23,634,367	1916	1,493,617	797,469,353
1909	127,731	158,918,506	1917	1,740,792	1,053,505,781
1910	181,000	213,000,000	1918	926,388	801,937,925
1911	199,319	240,770,000	1919	1,657,652	1,461,785,925
1912	356,000	335,000,000	1920	1,883,158	1,809,170,963
1913	461,500	399,902,000	1921	1,514,000	1,093,918,000
1914	543,679	413,859,379			

Motor truck production and wholesale value for years since 1904 follows:

Year	Number	Wholesale Value	Year	Number	Wholesale Value
1904	411	$946,947	1915	74,000	$125,800,000
1909	3,255	5,230,023	1916	90,000	157,500,000
1903 to 1910	10,374	20,485,500	1917	128,157	220,982,668
1911	10,655	22,292,321	1918	227,250	434,168,992
1912	22,000	43,000,000	1919	316,364	423,326,621
1913	23,500	44,000,000	1920	322,039	423,756,715
1914	25,375	45,098,464	1921	154,550	166,082,000

Cleveland Radiator Co. Succeeds Old Division

CLEVELAND, May 24—The Cleveland Radiator Co. has been organized to succeed the Cleveland radiator division of the Sparks-Withington Co. H. K. Hall, formerly general manager of the Sparks-Withington property, will be president and treasurer. E. S. Weidle, vice-president and sales manager, formerly was Cleveland branch manager of the McCord Manufacturing Co. of Detroit, and L. V. Grantier, the chief engineer, also was formerly connected with the McCord as the assistant chief engineer. D. A. Bird, superintendent of the Sparks-Withington Co., will be production manager.

The organization and plant now are complete, and both tubular and cellular radiators are in production. The output now is about 250 radiators a day.

Maibohm Overruled in Fight on Sale

SANDUSKY, OHIO, May 24—Objections to confirmation of the sale of the assets of the Maibohm Motors Co. to a creditors' committee headed by E. G. Kirby of Cleveland, filed by H. C. Maibohm, president of the old company, and F. W. Cushing, the vice-president, have been overruled.

Maibohm and Cushing informed Referee in Bankruptcy Belford that the creditors' committee for which Kirby acted represented only a part of the creditors and that if a new sale was ordered a larger bid would be made. Maibohm said he was willing to file a bond against loss. It was brought out at the hearing that Storey & Co., New York brokers, were back of the Maibohm proposal. It is understood, that they had plans under way for reorganization of the company by issuing $500,000 in bonds and acquiring from the Mercer Motors Co. the manufacturing rights for the Simplex car, which would have been put out in a modified form at a moderate price.

The creditors' committee which bid in the property last week represented more than 80 per cent of the creditors. It proposes to turn the assets over to a new Ohio corporation known as the Arrow Motors Co.

It is understood Maibohm may appeal to Federal Judge Killits.

Sue Insurance Directors

ROCK RAPIDS, IOWA, May 24—Charging that seven Rock Rapids residents, former directors of the Interstate Automobile Insurance Co., defrauded the company of $347,500, E. H. Hoyt, receiver, has secured an order to bring action to recover that amount.

Improvement Is Real, Milwaukee Bank Says

Parts and Equipment Makers in District Are Operating at Capacity

MILWAUKEE, May 22—Constantly increasing production, which is carrying passenger car factories to within 100 per cent of normal operations, and manufacturers of automotive parts and equipment to the limit of capacity to make deliveries according to specifications, is the distinct feature of the automotive industries at this time in the Milwaukee and Wisconsin district.

Testimony that the improvement up to this time has been real and not in any way artificial or fictitious is adduced by the research experts of Milwaukee's largest bank, the First Wisconsin National, which in the May number of *Business and Financial Comment*, a monthly summary of local conditions issued by the bank, says:

"Automotive parts and accessories manufacturers continued to have good business during the past month. Employment in this group increased 5 to 10 per cent during the month of April, and this has been accentuated so far in May."

Conservative View Taken

The summary then takes a conservative view and says:

The seasonal nature of the automobile business, however, has to be taken into consideration. From about June 1, activity generally slows down and starts up again in August. Despite the good showing of the automobile companies for the last two months, it is too early to assume that this will be a year of spectacular motor car production except for a few concerns.

Delving into retrospect and prospect, the summary says:

Study of automobile statistics has developed the fact that for several years new demand has centered on the low and medium-priced cars. It would be interesting to find out the progression of buying from the lower to the medium and higher-priced cars. There must be a more or less regular tendency for buyers to go from a cheap to a medium-priced car, but the number who graduate into the higher-priced class is naturally much smaller. The production and registration figures show that the expensive car class has increased relatively little for the past five or six years.

Good Bus Outlook

Regarding the motor truck industry, the review says:

Production and sales of motor trucks have been making slower progress than is the case with passenger cars. On the other hand, however, the possibilities of passenger and freight transportation by motor bus or truck are just beginning to be realized. Heretofore the railroad and traction lines have occupied the field of mass transportation as distinguished from the individual service of the automobile. Now we appear to be coming into a period when, for distances within a radius of 100 miles, the truck and bus will to some extent supersede or supplement rail transportation.

Tangible evidence of the improved position of passenger car and parts factors in this as well as other districts in the United States is provided by the reports coming daily from various industries, telling of progress of a substantial sort.

CENTRAL CHINA GETS ITS FIRST TRACTOR

WASHINGTON, May 22—The first tractor ever used in central China was included in a shipment of American agricultural machinery recently received at Hankow, the Department of Commerce has been informed by Consul General Heintzleman.

The order was placed through an American house at Hankow in connection with the development by a group of Chinese capitalists of 13,000 acres of land in northern Honan on the Yellow River. The promoters intend first to undertake the cultivation of peanuts. If the machinery just received proves satisfactory, additional orders will be placed.

Orders Keeping Plants Running at Top Speed

(*Continued from page* 1132)

to be prepared for emergencies and with commitments only for short terms they will be able to turn around, no matter what happens.

Skilled automotive labor is scarce in the principal centers, such as Detroit, Cleveland and Indianapolis, and many young men who returned to the farms when they were laid off during the slump of 1920 are going back to the factories. The consequence is that farm help is getting scarce, especially in Michigan.

Up to the present motor vehicle builders have not begun to bid against each other for factory help as they have in other boom days. They are operating on a much smaller margin of profit than they did then and if labor costs go up materially it will be necessary to raise car prices. Metals are somewhat higher than they were a few weeks ago and parts prices have stiffened since makers cleaned up their inventories and partly fabricated stocks.

STUTZ DEALERS TO MEET

INDIANAPOLIS, May 24—The custom of holding sales conventions during the week of the 500-mile international sweepstakes will be followed by but one Indianapolis factory this year. The Stutz Motor Car Co. of America will hold a three-day sales convention May 29 to 31 inclusive.

Rail Official Urges Roads Aid Shipments

Circular Outlines Helpful Measures—To Add More Automobile Freight Cars

NEW YORK, May 22—The traffic department of the National Automobile Chamber of Commerce has been informed that M. J. Gormley, chairman of the car service division of the American Railway Association, has sent to all members a circular calling attention to the extraordinarily heavy shipments of automobiles. The circular states that it is highly important, in order to fully supply rail transportation, for the heavy automobile shipments that:

(1) Automobile cars be moved promptly, loaded or empty, to owners or nearest automotive producing territory.

(2) Cars be not loaded with traffic which takes them out of route either to the owner or to the territory where this equipment is required for automotive loading.

(3) Automobile cars be not loaded with commodities such as cement, lime, plaster and other bulk freight that leaves a residue of dust in the car that will damage the finish of automobiles when later used for that loading. Many hundreds of automobile cars have been rejected at automobile plants for this reason, and in view of the generally ample supply of other suitable equipment such service for automobile cars is not justified.

(4) Owners give such special attention as may be necessary to the repair of automobile cars to keep sufficient number in service to supply demands.

Additional substantial orders for automobile freight cars have been placed by the railroads. The Missouri Pacific is planning to build 2000 which will be reinforced for double decking. The Southern Railroad has ordered 500, and the Chesapeake & Ohio 100. The St. Louis and Southwestern is building 350 in its own shops, and the Chicago, Milwaukee & St. Paul proposes to build 500.

OLD KNOX OFFICERS INDICTED

MT. VERNON, OHIO, May 22—Indictments charging embezzlement and violation of the Ohio blue sky laws have been returned against five former officers and directors of the Knox Tire & Rubber Co. The men indicted are F. D. Spencer, E. Scott Cannell, D. E. Frantz, V. V. Hendershot and C. B. Carpenter. The five are charged with the embezzlement of an amount aggregating $26,200. The blue sky law indictments supersede similar indictments found a year ago, which were declared to be faulty.

TRAFFIC TO JOIN MERGER

ST. LOUIS, May 22—Stockholders of the Traffic Motor Truck Corp. have ratified the plan calling for the transfer of all the assets of the company to the Associated Motor Industries, Inc., which, in turn, will assume all the liabilities of the Traffic Corporation. Stock of the truck company will be exchanged for securities of the Associated Motor Industries.

Plants Speeding Up in All Branches of the Industry

Working on Fisk Contract

PONTIAC, MICH., May 24—The tire mold department of the Wilson Foundry & Machine Co. is being worked at capacity on a schedule which is expected to last until fall. The company closed a large contract during the winter with the Fisk Rubber Co., which will probably not be completed until September.

Efforts are being made to boost the production of Knight engines for the Willys-Overland Co. to 175 daily, which is 25 in excess of the largest prediction for production in the Knight plant when it was removed here from Elyria. At present the production runs around 100 daily. Night shifts are being put on to reach the higher figure. The Overland engine department maintains a fairly steady schedule in the vicinity of 400 daily.

Seiberling Speeding Up

BARBERTON, OHIO, May 24—Operations of the new Seiberling Rubber Co.'s plants here and at New Castle, Pa., have been speeded up to 2400 tires a day, including over 1500 Seiberling cords made at the Barberton plant. The New Castle plant is making Portage tires exclusively for Seiberling.

While orders for large size tires now are being filled immediately, production is behind orders for small sized Seiberling tires. The estimated net profits of the company for April were $25,000, while profits this month are expected to reach $100,000. As there is $800,000 of 8 per cent preferred stock outstanding on which the annual dividend aggregates $64,000, the company will more than earn the dividend for the year this month.

Rolls-Royce Program Enlarged

SPRINGFIELD, MASS., May 24—As orders are running ahead of production at the Rolls-Royce plant here an increased rate of output for June is scheduled, notwithstanding the big May expansion. The company has leased the large six-story factory building of the Knox Motors Co. for the manufacture of bodies.

This branch of production is being organized under George W. Kerr, superintendent of coach work, and it is expected the plant will be in full operation by the latter part of June. Mudguards are the first item to be made in this building and others will be added until practically the entire body work for the Rolls-Royce car will be done in the building.

Fyrac Gains 102 Per Cent

ROCKFORD, ILL., May 24—The Fyrac Manufacturing Co., manufacturer of spark plugs, reports a 102 per cent increase in sales for April, 1922, over April of last year. Orders received thus far, the factory states, make it a certainty that May will be an even bigger month than April. The company is planning production on that basis and its factory is working full time continuously.

MORE MEN AT WORK

DETROIT, May 22—Additional workers to the number of 5217 were engaged last week by the members of the Employers Association. This brings the total to a new high mark of 164,106, as compared with 118,497 for the same week in 1921 and 189,000 for the same week in 1920.

Durant Working on Plant at Oakland

OAKLAND, CAL., May 24—Announcement is made by R. C. Durant that within 60 days from May 15 the factory of the Durant Motors Co. of California, now being erected in this city, will be in operation. The plant is being built at a cost of approximately $3,000,000, says the announcement, and has 300,000 sq. ft. of floor space, with capacity for an annual output of 50,000 cars. Employment will be furnished for 800 to 1000 men, with an office force of 200. The annual payroll at the start will be $2,000,000 a year, according to this announcement.

50 Franklins Daily

SYRACUSE, May 25—A production schedule of fifty cars a day will be started May 29 by the Franklin Automobile Co. This basis of permanent production will be the largest in the history of the company, except for a short time about two years ago when the plant here produced cars at the rate of fifty-five a day. The schedule has been forty-five cars a day.

Packard at Highest Point

DETROIT, May 23—The Packard Motor Car Co. is now at the highest production and sales point of its career, according to a signed statement by President Alvan Macauley. New orders are developing in increasing volume, the statement said, and indications are that the peak has not been reached.

Wills Expands Factory Space

DETROIT, May 24—C. H. Wills & Co. have taken over the building formerly occupied by the Illinois Tool Co., which adjoins the Wills plant at Marysville, and will operate it as a department of the Wills factory. A large number of men will be added to the payroll.

Transport Surpasses Records

MOUNT PLEASANT, MICH., May 22—Transport Truck Co. reports that the total number of orders placed by distributors for April delivery topped the record of any corresponding month in previous years of Transport history.

Spring Demand Heavy

MILWAUKEE, May 25—At present lack of body production facilities is keeping the output of the Nash Four at Milwaukee to 55 or 60 cars a day, it being necessary to transfer cars for finishing. When the company's new shop is finished, this will be eliminated and the Nash Four will be practically a 100 per cent Milwaukee product. The Kenosha plant is now making 97 per cent of the Nash Six under one roof.

The Harvey Spring & Forging Co., Racine, Wis., has brought production up to 100 per cent of ultimate capacity and is not able to accept all orders tendered, especially car manufacturers' equipment business. The call from the wholesale and jobbing trade for springs is very heavy, while contracts from passenger car makers is taxing capacity to the utmost.

Motor Wheel Adds to Plant

LANSING, MICH., May 24—Taxed to capacity by orders which have necessitated overtime production in both the wood and steel wheel departments, as well as in the Gier Stamping plant, the Motor Wheel Corp. has let a contract for the construction of two additional units.

Work will start immediately on both these additions, the completion of which in about sixty days will not only release space in the present plants needed for various departmental expansion, but will furnish a very considerable amount of added manufacturing space.

Oakland Business General

PONTIAC, MICH., May 24—April sales by the Oakland Motor Car Co. were larger than in September, 1920, which was the second largest month in the history of the company, according to C. J. Nephler, general sales manager. Sales for the first half of May were 66 per cent in excess of the same period in April, and it is stated that orders are coming from all sections of the country rather than from any particular territory.

Hard to House Employees

ALMONT, MICH., May 24—The Almont Manufacturing Co., making gray iron castings, has experienced such a rush of business that it has been necessary to promote a housing campaign in the town to provide quarters for additional employees. Twenty-five residences are now under way on property near the plant.

Maxwell at Top Speed

DETROIT, May 24—The Maxwell Motor Corp. will go into production on a basis of 400 cars a day for the remainder of May. The company now has a second assembly chain in operation and is working at top speed.

FINANCIAL NOTES

Packard Motor Car Co. comparative balance sheet as of Feb. 28, 1922, shows accounts receivable on that date of $2,523,594, as compared to $3,290,994 on Aug. 31, 1921; inventories of $16,778,062, against $21,230,445; cash $3,890,950, compared to $4,523,716, and deferred installments, notes and bills receivable $1,466,827, against $1,144,260. The accounts payable and payrolls were $428,659 on Feb. 28 and $2,188,270 on Aug. 31. On Feb. 28, 1922, net tangible assets applicable to the common stock amounted to $26,516,806, or $22.31 per share of $10 par value.

Chandler Motor Car Co. for the four months to May 1 earned in excess of $1,000,000. In this month and June it expects to earn a similar amount. On 280,000 shares of capital stock this is the equivalent of just over $7 a share. The company will have more than earned its $6 annual dividend with a slight margin to spare, in the first six months, leaving earning power of the second half year available for strengthening surplus account, which in 1921 was drawn down $2,300,000 in the maintenance of dividends.

Moon Motor Car Co. is marketing through a syndicate composed of Lage Brothers & Co. and William H. Colvin & Co. of Chicago 60,000 shares of a total of 154,213 shares outstanding of no par value common stock at $9.50 a share. This stock has always been closely held and has never before been offered to the public. Application will be made to list the stock on the New York curb.

Hudson Motor Car Co. has declared an initial dividend of 50 cents a share on the capital stock, payable July 1 to stock of record June 20. The company when incorporated issued in compliance with the state laws of Michigan 100 shares of $10 par stock. A dividend of $2.50 a share has been declared on this stock, payable on the same date as the capital stock dividend.

Republic Motor Truck Co., Inc., announces that all coupons on its first mortgage and collateral trust 7 per cent serial notes, which matured May 1, 1922, and Nov. 1, 1921, will be paid upon presentation at Bankers Trust Co., New York. Also six months' interest at the rate of 7 per cent will be paid upon Series "B" notes, which matured Nov. 1, 1921.

Hood Rubber Co. reports sales for 1921 of $23,844,436, against $32,867,000 in 1920 and $25,444,016 in 1919. Sales for the first three months of 1922 were $5,767,965; for the same period of 1921 they were $4,376,293. Regular dividends for 15 months amounting to $921,750 were paid on preferred and common, leaving a substantial surplus.

Martin-Parry Body Co.'s preliminary earnings statement for April shows a net income of approximately $250,000, compared with less than $100,000 in the corresponding month last year. New orders show an increase of approximately 100 per cent over those booked for the same period in 1921.

Stewart-Warner Speedometer Corp.'s 8 per cent convertible bonds, which will mature on March 1, 1926, have been called for retirement on Sept. 1 at 104 and interest. There are $1,850,000 of the bonds outstanding. The company has decided to anticipate the maturity.

Detroit Air Cooled Car Co. has been given authority by the Michigan Securities Commission to sell stock in the state. The company, which is incorporated under Delaware laws, has a capital of $1,200,000.

Lee Rubber & Tire Co. for the first quarter of 1922 reports net earnings of $139,360, against $77,742 for the same period last year. The quarterly dividend calls for the payment of $75,000.

Mack Trucks, Inc., estimates net profits in April to be in excess of $300,000, equitable at the annual rate of about $8 a share on the common stock.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

During last week call money was much easier, ruling at 3½ per cent throughout most of the week. The range was from 3 per cent to 3¾ per cent, as compared with 3½ per cent to 5½ per cent in the previous week. There was some relaxation noted in time money, the range being from 4 per cent to 4½ per cent for all maturities up to six months, as compared with 4¼ per cent in the previous week. This ease in time money was displayed despite Government withdrawals from local institutions amounting to $18,000,000, and a shipment of gold to the amount of $1,000,000 to India. The prime commercial rate remained unchanged at 4¼ per cent.

The Federal Reserve statement of May 17 showed a decrease of $151,000 in gold reserves but an increase of $1,308,000 in total reserves. Total bills on hand decreased $14,284,000, total earning assets $36,806,000, and deposits $3,167,000. Federal Reserve notes in circulation showed a decline of $12,530,000 to $2,146,656,000, which marks the lowest level since August 31, 1918. As a result of these changes the reserve ratio increased from 77.3 per cent to 77.6 per cent.

For the month of April the output of bituminous coal amounted to 15,780,000 tons, or a little less than one-third of the March production. This is the smallest production of bituminous coal for any month in the last ten years. Up to the close of the sixth week of the strike (May 13) the total output of coal since the strike began was 23,826,000 tons of bituminous and 39,000 tons of anthracite.

In the corresponding period of the 1919 strike, anthracite mines working to capacity produced 11,816,000 tons. The bituminous mines which remained in operation contributed 29,329,000 tons, making a total of 41,145,000 tons. It must be noted, however, that 1919 was a "boom" year and the willingness of industrial plants to pay high prices in order to ensure continuous operation at full capacity led to a greater effort on the part of the mine owners to provide the coal necessary in spite of the strike conditions.

TAXICAB COMPANY INSURED

OMAHA, May 24—The Zurick General Accident & Liability Insurance Co. has issued to the Yellow Cab & Baggage Co. of this city a policy for $760,000, indemnifying it against accident.

Program Submitted by Tractor Makers

Advanced Plans for Educating Farmer Proposed to Department of Agriculture

WASHINGTON, May 23—An educational program to educate the American farmer to power tractors and other power driven farm equipment has been proposed to the Department of Agriculture by the National Association of Farm Equipment Managers. The program, if adopted and carried out by the department, it is declared, will be one of the most advanced plans ever advocated for the successful farmer.

Primarily the program as outlined, which will be submitted to Secretary Wallace, is one of educating the farmer to use power farm equipment instead of horse and mule power. If the Department will adopt some sort of program to disseminate information showing the relative cost of horse power vs. mechanical power, the National Association of Farm Equipment Managers has agreed to compile statistics on the relative cost, working in co-operation with the industry.

In discussing the program to-day, F. R. Todd, vice-president of the Deering company, Moline, Ill., said:

The thing in a nut shell, which we have proposed to the Department of Agriculture, is to educate the farmer, through its various mediums available, to power equipment. Statistics already available show that power equipment is far superior to horse power and there is no way of estimating what the farmer loses annually by his continued use of horses and mules to till his land, as compared to what the cost is under the most improved methods of mechanical farming.

Wish Government Appropriation

The idea of educating the farmer to mechanical equipment will be under the active supervision of the tractor and thresher department of the association which has offered its services to the department, and which, it was stated to-day by Todd, will follow up the idea placed before the agricultural officials in an endeavor to secure an appropriation for the department in furthering the use of mechanical equipment on farms.

Guy H. Hall has been chosen by the tractor and thresher department to represent that association in co-operating with the Government. Hall was selected because he is a director of the National Institute of Progressive Farming, with headquarters in Chicago. He will act as liaison officer of the association in co-operating with the Department.

The delegation of equipment manufacturers in addition to Hall and Todd was composed of Finley P. Mount of the Advance-Rumely Co., La Porte, Ind., and J. B. Bartholomew of the Avery Plow Co., Peoria, Ill.

A full report of the final recommendations made by this committee and the action taken by the department will be made to the association at an early date.

INDUSTRIAL NOTES

Arrow Tool & Manufacturing Co., Bridgeport, Conn., will change its name on June 1 and do business under the name of the Forsberg Manufacturing Co., the change being due to the fact that another company, longer in the field but doing the same character of business, uses the word "Arrow" in its name and trademark. The Forsberg company will continue making tools and special machinery. There will be no change either in the ownership or management of the company. A modern, up-to-date press room has been added to the company's plant to take care of orders for stampings and sheet metal specialties in large quantities.

Simms Foundry Co. of Racine, Wis., has effected a consolidation with the **Racine Furnace & Foundry Co.**, and the merged concerns have been jointly reincorporated as the Simms Foundry Corp., with $200,000 capital. The combined capacity of the two plants is 50 to 60 tons a day, with a normal force of 300 operatives. Officers of the new company are: President, Horace R. Simms; first vice-president, J. Harvey Manny, Chicago; second vice-president, Griffith G. Jones; secretary, George L. Buck; treasurer, James V. Rohan.

G. F. Armstrong, president of the Armstrong Rubber Co., has purchased the Martin Tire & Rubber Co. at West Haven, Conn., and incorporated it under the name of the West Haven Rubber Co., with the same officers that are now serving with the Armstrong company. Production will center on cord tires, the plant having a present capacity of about 200 daily. Armstrong Rubber Co. is now making additions to its Garfield, N. J., plant that will increase its present output of 500 a day.

Johns-Manville, Inc., and the Johns-Pratt Co. announce that after June 15 each company will manufacture and market its respective products separately. The former corporation has acted as exclusive selling agents for the products manufactured by the latter for a number of years. It is felt now, the companies state, that the greatest economy to all interested will be in direct sale by the manufacturer through organized distributors.

Rotary Tire & Rubber Co.'s plant at Zanesville, Ohio, which is in the hands of Guy Winegarner as receiver, will probably not be put into operation in the immediate future. Previous to the appointment of a receiver prospects were bright for the reorganization of the company, and there was a likelihood that the plant would be purchased by the Studebaker-Wulff Co. of Columbus, but these negotiations fell through.

P. E. Werner, formerly of Akron but now of Kansas City, has purchased the Kansas City Tire & Rubber Corp., which has been in the hands of a receiver since May, 1919. The plant, which is equipped for the manufacture of tires and tubes, has been leased since the receivership by the Rubber Manufacturing Co., of which Werner is the head. Werner has also assumed management of the Sioux City Tire & Manufacturing Co.

Harmon D. Palmer, chief engineer of the **Kissel Motor Car Co.**, Hartford, Wis., has been granted patents on a new design of cast steel spring hanger to overcome rattling and other noises. The patent has been assigned to the Kissel company, which is equipping its cars with the new device as stock equipment.

Lomar Manufacturing Co., Middletown, Ohio, manufacturer of shock absorbers, has been incorporated in Ohio for $100,000, all common stock. The officers are: C. W. Shartle, Jr., Middletown, president and general manager; Tom Randolph, Houston, Texas, vice-president and director; L. L. Lomar, Middletown, general superintendent.

Kelly-Springfield Tire Co. of New York has executed a lease of the first and second stories of a large building in Milwaukee for warehouse and general headquarters purposes. The lease is for a period of ten years.

Unique Storage Battery Co. has begun the manufacture of storage batteries at its plant in Buffalo. W. F. McClashan is president and A. A. Brehm, secretary of the company.

Federal Motor Co.'s plant at Indianapolis, formerly occupied by the Empire Motor Car Co., is being placed in readiness for occupancy by the Frontenac Motor Co. of America.

Anderson Spring Lubricator Co., Inc., announces its removal to its new home, Revere Parkway at Spring Street, Everett Station (49), Boston.

Paramount Rubber Consolidated, Inc., announces that it has removed its executive offices to its factory at Little Falls, N. J.

Stutz Reports Net Loss of $632,370 at End of 1921

NEW YORK, May 25—The Stutz Motor Car Co. of America for the year ended Dec. 31, 1921, reports a net loss of $632,370, after expenses, inventory losses, etc.

There was a decided change in the balance sheet at the end of 1921 as compared with the end of 1920. The inventory was reduced from $3,049,238 to $1,890,608, while accounts and notes receivable declined from $285,297 to $75,-222. Current liabilities including notes were $302,482, as compared with $1,339,-871 at the close of the previous year.

In his report to stockholders, William M. Thompson, president of the company, reviews conditions in the automobile market last year. He states that the efforts of the corporation and its officers have been centered almost entirely on problems of manufacturing and sales efficiency, and describes improvements in the car.

DURANT PLANT ANNIVERSARY

LANSING, May 24—The Lansing plant of Durant Motors celebrated its first anniversary yesterday by turning out 123 cars. A year ago the site which the plant now occupies was an apple orchard. In that period the factory has been built and substantial production reached. The output will be increased as rapidly as possible.

REGAL TIRE IN LIQUIDATION

SHERBROOKE, QUEBEC, May 23—Shareholders of the Regal Tire & Rubber Co. have been advised that the company has been officially placed in liquidation and it is most likely that the property will be offered for sale in the near future. The Red Arrow people will probably secure the property.

METAL MARKETS

It is in those steel products of which representative tonnages enter into automotive consumption that tight conditions prevail with reference to the supply, so much so that in sheets, for instance, premiums are becoming more and more frequent. It is true that in isolated instances premiums have also been paid by the oil industry for tank plates needed for immediate construction of storage tanks. Price conditions surrounding steel products chiefly entering into the building industry and railroad equipment compared with those prevailing for the steel products which the automotive industries require are, however, relatively easy. Of course, there are some very good reasons for this state of affairs. Having bought earlier in the year from hand to mouth and steadfastly avoided all commitments for deferred deliveries, automotive buyers could hardly hope that when the tide turned they would find the steel producers in a mood to make sacrifices for the sake of accommodating them.

Costs of production have not declined. If any change has taken place in the last few weeks, it has been in the opposite direction. Freight rates are still high and the fuel situation, while not critical, entails additional cost burdens. Moreover, in spite of the slow formation of a premium market on some products, the bulk of the steel that is now being shipped, billed, and paid for was sold at prices that did not ease the load of financing perceptibly. The last few days, however, have witnessed a return to conditions that can not help but result in further accentuation of the tight fit of supply and demand, especially in the sheet market. Automotive purchasing agents, as in the days of the post-armistice flurry, are again waiting on sales managers and begging, hat in hand, for early shipments. The "price no object" attitude is once more to the fore.

It is just two years ago that $75 was considered a low price for open-hearth sheet bars and, while to-day's quotations are less than one-half that level, conditions bear much resemblance to those hectic days. Again we hear of negotiations by passenger motor car builders for sheet bar tonnages to be delivered to non-integrated rolling mills for conversion. Certain it is that the steel market, in so far as the automotive industry's requirements are concerned, is once more dominated by the seller.

Pig Iron.—The market which is now 20 to 25 per cent higher than it was three months ago, continues strong, the Chicago foundry market now being on a $23 base. There are still quite a number of furnaces out of blast and production could be materially increased. Some English iron has begun to come in.

Steel.—Nonintegrated sheet rollers fight shy of naming a third quarter price for full-finished automobile sheets, but in one quarter a 5 cent price has been forecasted, based on a $38 sheet bar market. As intimated several weeks ago in this report, prices for bolts and nuts have been advanced 10 per cent. Some strip steel interests now ask 3.75¢, base Pittsburgh, for cold-rolled and quotations for hot-rolled range all the way from 2 to 2.50¢, Pittsburgh.

Aluminum.—Some of the importers are now asking 19¢ for 98 to 99 per cent virgin ingots, but others continue to name 18.50¢. Automotive demand is broader.

Copper.—Fractional advances have taken place in copper, copper products and brass. Good demand from the automotive industries is noted.

Calendar

SHOWS

Nov. 13-18 — Chicago, Annual Show and Meeting of the Automotive Equipment Association.

FOREIGN SHOWS

March 10-July 31—Tokio, Japan, Peace Exhibition.

May — Shanghai, Exhibition of Road Building Material.

May, 1922—Quito, Ecuador, Agricultural Exposition, celebrating Centenary of Ecuador. Automotive Section.

May 6-21—Scheveningen, Automobile Show.

May 24 - June 5 — Barcelona, Spain, Automobile Show under Dealers' Direction.

May 28-June 5—Prague, Motor Show. Hotel de Ville.

July 1-24—London (Olympia), Aircraft Exhibition.

Sept. 1922 — Rio de Janeiro, Brazil, Automobile Exhibits in Connection with the Brazilian Centenary Associação Automobilista Brazileria.

Sept. 15-20—The Hague, Automobile Show.

Sept. 25-Oct. 3—Berlin, Automobile Show at the Kaiserdamm Hall under the auspices of the German Automobile Manufacturers Association.

September — Buenos Aires, Argentina, Annual Exhibition, Sociedad Rural Argentina.

Oct. 4-15 — Paris, Automobile Show, Grand Palais.

Nov. 3-11 — London (Olympia), Automobile Show.

Nov. 10 - Dec. 19 — Brussels, Automobile Show, Palais de la Cinquantenaire.

Nov. 29-Dec. 4—London (Olympia), Cycle and Motorcycle Show. British Cycle Motors, The Tower, Warwick Road, Coventry.

November—Buenos Aires, Argentina, Annual Exhibition, Automovil Club Argentino.

RACES

May 30 — Indianapolis, International Sweepstakes.

July 15 — Strasbourg, French Grand Prix.

CONVENTIONS

May 19-20—St. Louis, Annual Meeting of the American Automobile Association.

May 22-25—New York, Palisades Interstate Park, Second National Conference on State Parks, Bear Mountain Inn.

June 11-15—Milwaukee Annual International Convention of the Associated Advertising Clubs of the World.

June 19-20 — Detroit, Summer Convention of the Automobile Body Builders Association.

June 19-24—Colorado Springs, Summer Meeting, Automotive Equipment Association.

June 26-July 1—Atlantic City, Twenty-fifth Annual Meeting of the American Society for Testing Materials, Chalfonte-Haddon Hall Hotel.

August 28-Sept. 2 — Detroit National Safety Congress.

Sept. 18-23, 1922—Rome, Italy, Second Annual Meeting of the International Chamber of Commerce.

S. A. E. MEETINGS

June 20-24 — White Sulphur Springs, W. Va., 1922 Summer Meeting of Society of Automotive Engineers. Detroit, May 19. The Pennsylvania section will hold an outing at Torresdale or a body meeting on May 25.

Highway Conference Appoints Committee

WASHINGTON, May 24—Discussion preliminary to a series of conferences between Federal, state and automotive engineering officials to-day resulted in the appointment of a standing committee to meet on call of the chairman to study the whole question of motor vehicle restrictions.

The conferees discussed the necessity of developing roads from an economic standpoint and advantageous maintenance standards of weights, sizes, loads and weight distribution, advisability of seasonal restrictions, and if advisable by whom they should be made. Overloading and overspeeding also were taken up.

In regard to highway finance, the advantages and disadvantages of the present system were discussed. Advisability of laying down a uniform program as between states and the proper distribution of the cost of highways were gone into by the conferees, but action was deferred pending further discussion.

The following were named as a standing committee to consider the problems involved at a series of conferences, the first of which will last two days and will be subject to call of the chairman:

T. H. McDonald, chief of the Bureau of Public Roads, chairman; C. H. Bennette of the Connecticut Highway Department; William O. Uhler of the Pennsylvania Highway Department; J. H. Mullen of the Minnesota Highway Department; N. J. Machall of the Maryland Highway Department; George P. Coleman of the Virginia Highway Department; W. C. Markham of the Kansas Highway Department; R. D. Chapin, W. T. White, A. J. Brosseau, George M. Graham, Alvan Macauley and Pyke Johnson.

"There is not very much that can be said of what we accomplished at to-day's meeting," Chapin said, "but the big thing is that for the first time in the history of the automotive industry representatives of that industry have met with Federal and state officials to discuss common problems, and to-day's meeting is but the first of a series of conferences out of which a great deal is expected to come."

Canada Sent 2312 Cars Overseas During April

WASHINGTON, May 24—The April exports of passenger cars from Canada totaled 2312, with a value of $1,358,222, while overseas truck shipments numbered 96, with a value of $41,663. Parts shipments were valued at $100,884.

These figures, just received from Canada, were announced to-day by the automotive division of the Bureau of Foreign and Domestic Commerce. The shipments in March were 2983 passenger cars valued at $1,731,886; 176 trucks valued at $81,982, and parts valued at $61,562.

DEDICATE BATCHELDER PARK

SUMMIT, N. J., May 22—A tract of 10,000 acres of land on top of Baltusrol Mountain has been dedicated as Batchelder Park in memory of the late Amos G. Batchelder, for many years secretary of the American Automobile Association, who was killed in an army ambulance airplane crash at Indian Head, Md., May 28, 1921. Part of the property was the home of Batchelder and is now occupied by his wife and daughter. The land was dedicated for building purposes and was named by Miss Marion Spooner, daughter of F. E. Spooner, secretary of the Old Timers' Club.

ACCESSORY MAKERS EXPAND

SPRINGFIELD, OHIO, May 23 — William F. Nutt, president of the Victor Products Co., has purchased the plant of the Excelsior Drill Co. here, owing to the increase in business. The company manufactures automobile accessories, including accelerators, glass wings, etc.

National Postpones Decision on Merger

NEW YORK, May 25—Stockholders of the National Motor Car & Vehicle Corp. of Indianapolis decided at a special meeting held at the corporate office here to refer back to the board of directors for further investigation the proposal to merge with Associated Motor Industries. Another special meeting will be called later to determine what shall be done.

The proposition submitted to the stockholders was either to accept the offer of the Associated Motor Industries for the assets of the corporation upon the basis of an exchange of securities or as an alternative the sale of all the property and assets of the corporation. It is understood that some of the creditors of the National company are opposed to the consolidation plan.

No date has been fixed for again submitting the views of the directors to the stockholders.

TO HOLD PETROLEUM MEETING

WASHINGTON, May 22—The United States Bureau of Mines announces that the interdepartmental petroleum specifications committee which prepares tentative specifications for all petroleum products, including gasoline, fuel and lubricating oil for the United States Government, will hold an open meeting in the auditorium of the Interior Building here at 9 a. m., July 3. At this meeting specifications for petroleum products will be discussed in detail and all persons interested are invited to attend and express their views on the subject.

BIG MAXWELL EARNINGS

DETROIT, May 25—William R. Wilson, president of the Maxwell Motor Corp., states that April net earnings of Maxwell consolidated, after interest and charges, is more than $500,000.